



**Puerto Rico
Electric Power
Authority**

DRAFT SUBMISSION – SUBJECT TO MATERIAL CHANGE

Puerto Rico Electric Power Authority

Amended & Restated Fiscal Plan

January 24, 2018

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Disclaimer on Purpose of this Submission

- The purpose of this submission is to comply with the Fiscal Oversight and Management Board's (FOMB's) mandated January 10, 2018 deadline to submit a draft of the amended and restated Fiscal Plan. Certain challenges make submission of a fully developed Fiscal Plan impossible at this stage. Those include, but are not limited to:
 - The impact of the recent catastrophic hurricanes resulting in limited visibility as to expected recovery and revenue collections and the longer term repopulation of the island
 - The impracticality of tying the FY2019 budget to the Fiscal Plan at this stage of the restoration
 - Uncertainty as to load forecast given uncertainty regarding macroeconomic indicators
 - Lack of visibility regarding the availability and terms of federal funding for the restoration and rebuilding plan
 - Limited information regarding future macro resource planning
- Puerto Rico's ability to execute on the transformation of the energy sector and the ultimate structure of any such transformation may be impacted by the amount, structure and terms of the federal funding available to support the transformation.
- This fiscal plan assumes as a base case that PREPA will cease to operate in its current form in 18 months. The transformation of the electric sector in Puerto Rico is anticipated to involve a sale of the existing generation assets, development of new generation and a concession by a public entity of the T&D. As a result, the transformation plan is attached to this fiscal plan for PREPA to provide a guide for evaluation, it does not constitute an integrated portion of this fiscal plan and is not presented for certification. The Government of Puerto Rico reserves all rights under Section 303 of PROMESA and otherwise to determine the future of the electric sector in Puerto Rico as a matter of public policy.
- This submission is a draft for all intended purposes. PREPA and the Government of Puerto Rico reserve the right to make revisions and changes as necessary, at their entire discretion.

I. Executive Summary

PREPA's Fiscal Plan Development has Followed a Deliberate Process Pursuant to which the Government Decided to Seek the Transformation of the Energy Sector

	Fiscal Plan certified	FY18 budget certified	Title III filed	Fiscal Plan revisions and amendments	Transformation Plan*	Exit from Title III (Plan of Adjustment)
Timeline	April 28, 2017	June 30, 2017	July 2, 2017	May – Sep 2017	Aug – Dec 2017	TBD, 2018-2019
What	<ul style="list-style-type: none"> Financial Oversight and Management Board for Puerto Rico (FOMB) certified PREPA Fiscal Plan for FY17-26 subject to amendments 	<ul style="list-style-type: none"> PREPA submitted its FY2018 budget, which the FOMB approved and certified, subject to reconciling and agreeing their requirements for a revised Fiscal Plan with amendments 	<ul style="list-style-type: none"> FOMB filed a voluntary petition under Title III of PROMESA in the United States District Court for the District of Puerto Rico 	<ul style="list-style-type: none"> PREPA continued to revise its Fiscal Plan in close coordination with the FOMB <ul style="list-style-type: none"> Impact of hurricanes Irma and Maria affected fiscal plan assumptions and objectives 	<ul style="list-style-type: none"> Working team established to develop operational and regulatory transformation plan <ul style="list-style-type: none"> The FOMB established a December 22nd deadline (later amended to January 10, 2018) to submit a draft amended Fiscal Plan based on certain principles set forth in a letter dated December 12th, 2017 	<ul style="list-style-type: none"> Determination of amount and terms of federal funds available to support transformation of energy sector <ul style="list-style-type: none"> Plan of adjustment approved by the Federal District Court

This fiscal plan assumes as a base case that PREPA will cease to operate in its current form in 18 months. The transformation of the electric sector in Puerto Rico is anticipated to involve a sale of the existing generation assets, development of new generation and a concession by a public entity of the T&D. As a result, the transformation plan is attached to this fiscal plan for PREPA to provide a guide for evaluation, it does not constitute an integrated portion of this fiscal plan and is not presented for certification. The Government of Puerto Rico reserves all rights under Section 303 of PROMESA and otherwise to determine the future of the electric sector in Puerto Rico as a matter of public policy.

PREPA's Historic Challenges in Operating and Maintaining the Electric System are now Exacerbated by the Catastrophic Damage Caused by Hurricanes Irma and Maria

Generation

- **Old and unreliable Generation** infrastructure (plants are 28+ years older than industry average)
- **Frequent power plant outages** (12 times more often than mainland US average)
- High dependence on **fuel oil and inability to diversify fuel mix** (<4% from renewables and 45% oil, relative to industry average of 4% oil)
- Principal generation located far from demand centers with a **poorly maintained** T&D infrastructure

Transmission and Distribution

- **T&D infrastructure that has not been adequately maintained**, further contributing to outages, losses, poor quality
- The **\$2.5 billion** estimated expenditure need identified by PREPA in the 4-28 Certified Fiscal Plan for **repair and maintenance** prior to the hurricanes is no longer sufficient and does not address necessary **resiliency and hardening**
- **Highly vulnerable** to catastrophic events impacting delivery of electric service

Collections and Customer Service

- Relatively high level of **technical losses and theft** (17% of energy lost in FY 2016 was higher than industry average; source: PREPA Planning and Research Directorate)
- Disorganized and ineffective **customer service infrastructure**
- **Inconsistent and unreliable** IT system for remote, reliable, and timely collections, and service
- **High vulnerability** to damage from disasters immediately impacting collections, revenue, and service



PREPA's Historic Challenges in Operating and Maintaining the Electric System are now Exacerbated by the Catastrophic Damage Caused by Hurricane Irma and Maria

Organizational

- Lack of **institutionalized processes and procedures**
- **Outdated systems** and information technology
- Above-market benefits in **collective bargaining agreements** with evergreen provisions
- **Underfunded pension obligations** (between \$2.3B - \$3.0B as of December 2016)
- Significant losses of experienced personnel

Environmental and Safety Compliance

- **Safety system and record dramatically below industry standards**
- **History of environmental non-compliance**
- Inability to execute PREPA's **strategic environmental compliance plan**, including timely compliance with MATS (Mercury and Air Toxic Standards) EPA emission limits

Operating Environment

- **PREPA's static business model** has not adopted changes in a rapidly changing and innovative industry
- Legal requirements to provide power to certain customers at **subsidized rates**
- **Poor quality** of electric service has impacted business and investment climate
- The resulting prolonged and ongoing recession has led to a significant **drop in energy sales**
- Poor credit rating leading **to lack of market access** and the inability to invest in needed capital expenditure projects

Post-Irma and Maria Challenges

- **Accelerated migration** of population
- **Accelerated demand reductions**
- **Greater possibility** of distributed generation and inside fence generation
- **Dramatic economic contraction and job losses**
- **Deeper distrust** in state-monopoly as sole provider of electricity

Due to all the challenges facing PREPA, the Government of Puerto Rico believes that the energy sector in Puerto Rico must be transformed through a partnership with private institutions (the "Transformation"). Therefore, this Amended and Restated Fiscal Plan assumes as a base case the transfer or concession of certain assets in connection with the Transformation.



II. Historical Context and Challenges

PREPA is Vertically Integrated and Sole Provider of Energy in Puerto Rico

Key statistics on PREPA



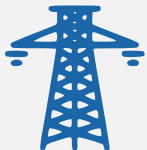
- **PREPA serves 1.5M** customers and has **6,227** employees



- For FY2017, PREPA had total revenues of **\$3.4B**, total assets of **\$9.4B**, and total liabilities of **\$11.4B**

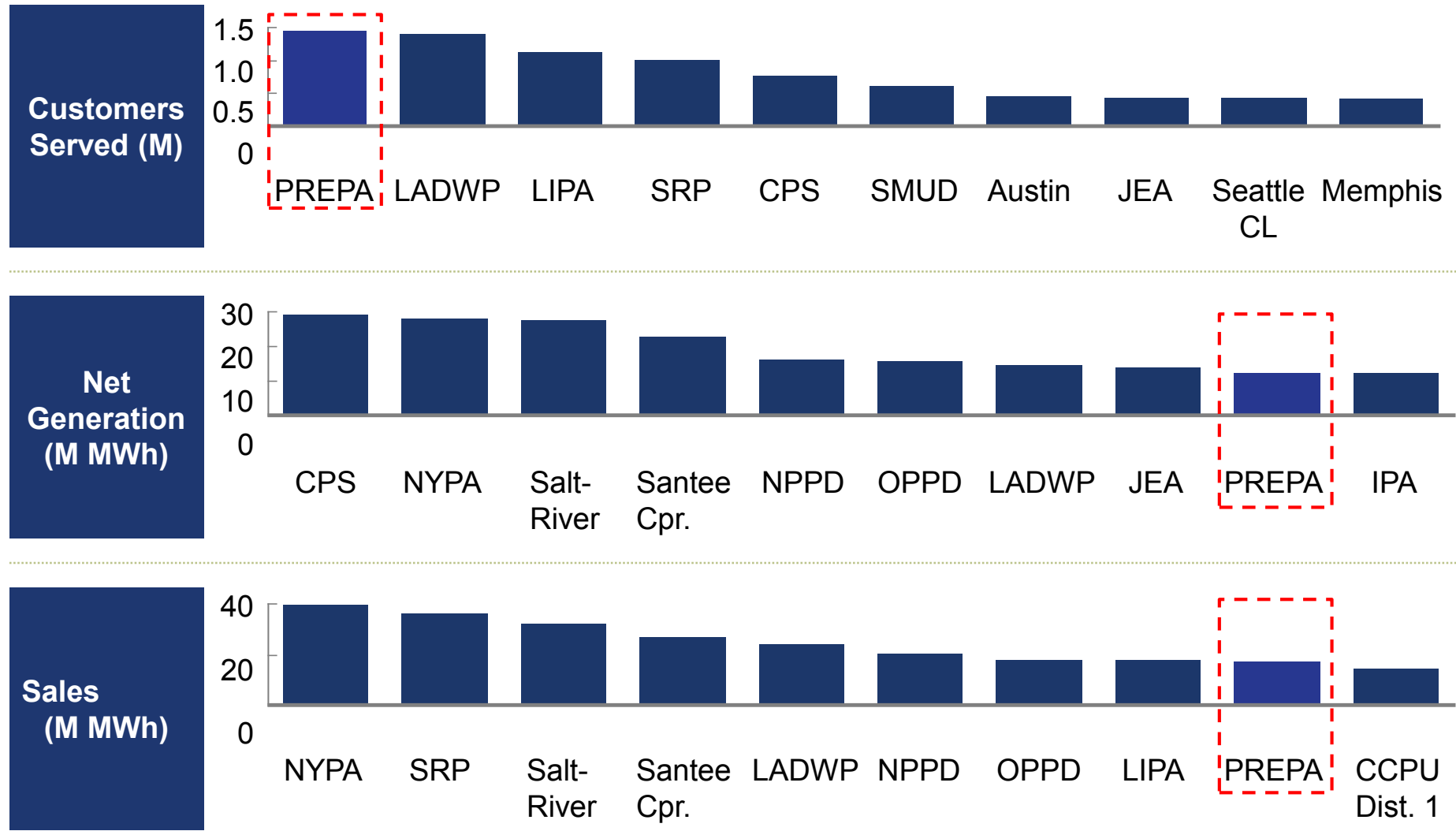


- Overview of generation system:
 - Generating Capacity: **5,839 MW (PREPA 4,878 MW; IPP 961 MW)**
 - **45%** of generation is from oil, compared with national average of **4%**
 - **31** major generating units in **20** facilities; older than national average
 - **4%** of generation capacity from renewables, vs. national average of 15%



- Overview of transmission and distribution system
 - Transmission Lines: **2,416 miles (230 kV / 115 kV)**
 - Distribution Lines: **30,675 miles (38 kV, 13 kV, 8 kV, 4kV)**
 - 38 kV substations: **283**
 - 115 kV substations: **51**

PREPA is One of the Largest Public Power Utilities in the US by Customer, but has Relatively Low Generation and Sales on a Per Customer Basis



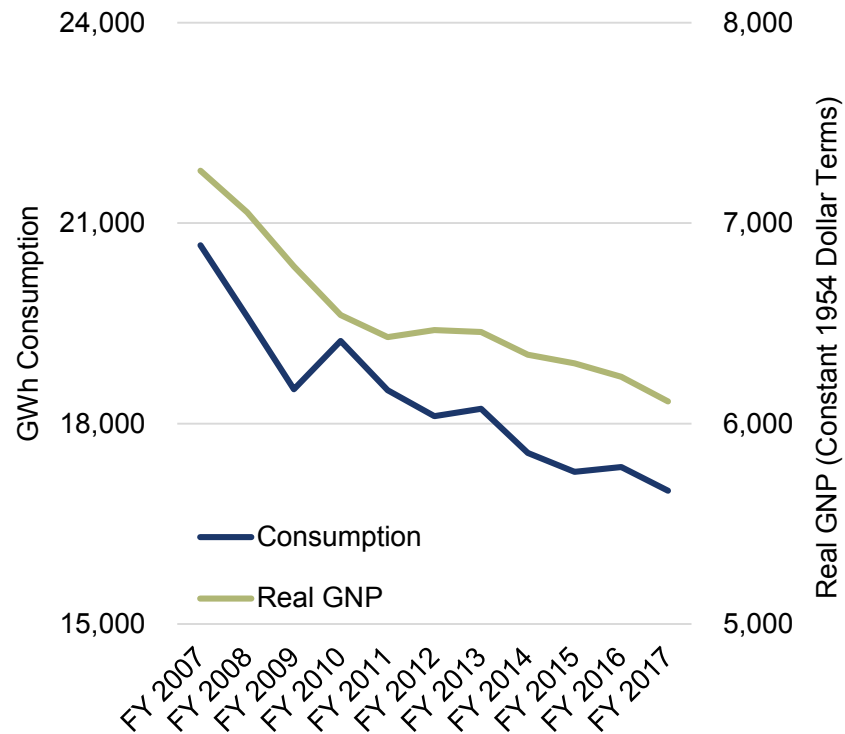
Source: PREPA, as of June 30, 2016, based on unaudited results

APPA. "U.S. Electric Utility Industry Statistics, 2014". 2016-2017 Annual Directory & Statistical Report

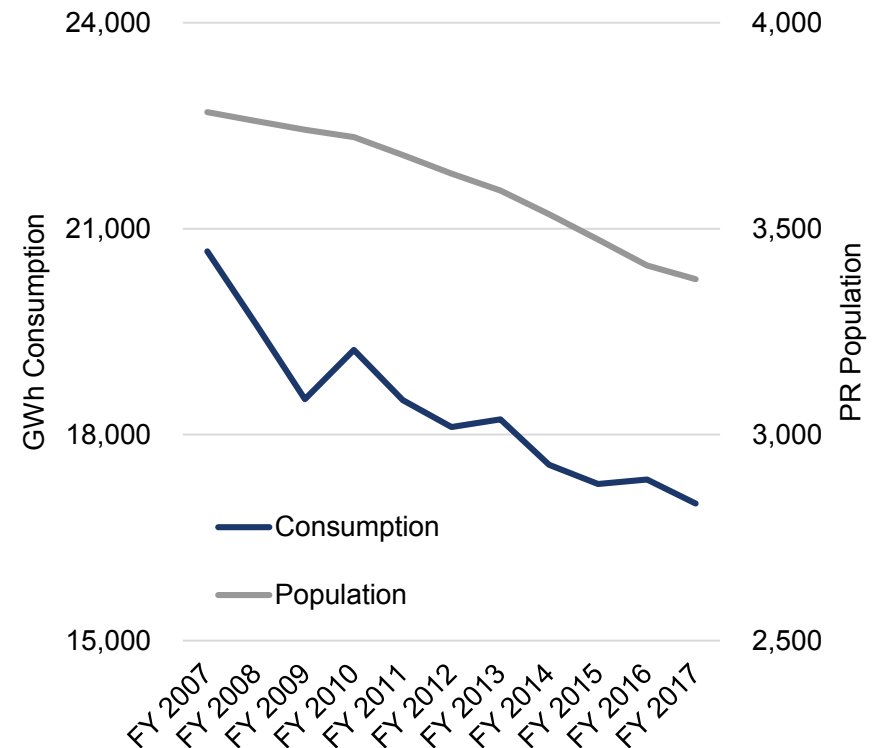
Poor Macroeconomic Trends have Deepened Impacts upon PREPA's Operations

As the economy deteriorated, population declined, and disruptive technologies have emerged, demand dropped 18% from 2007 to 2017

Consumption dropped similarly to GNP from 2007 to 2017

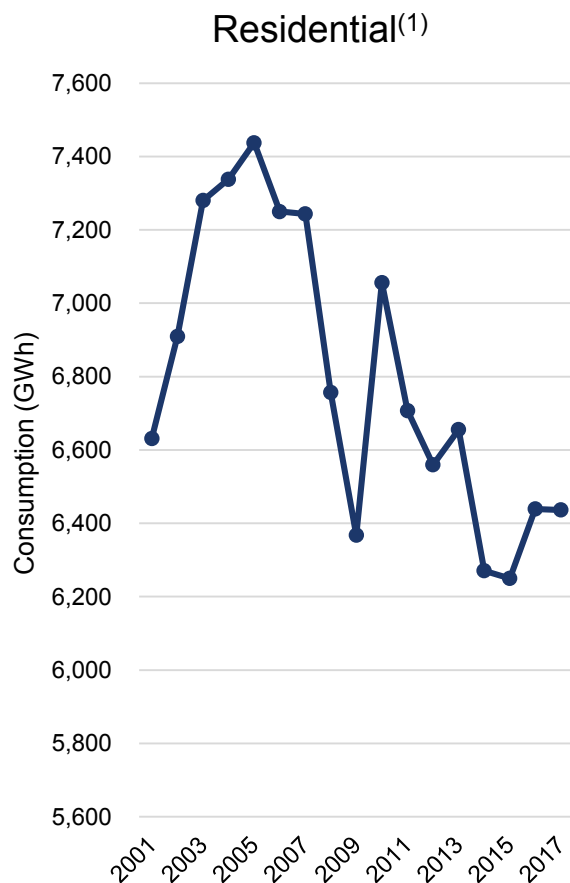


Consumption dropped with population from 2007 to 2017

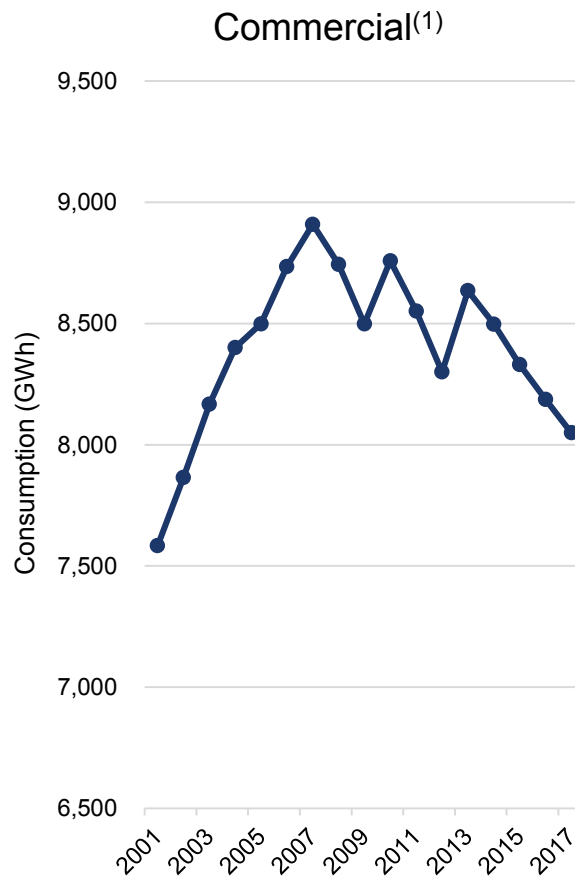


PREPA's Historical Load by Customer Class

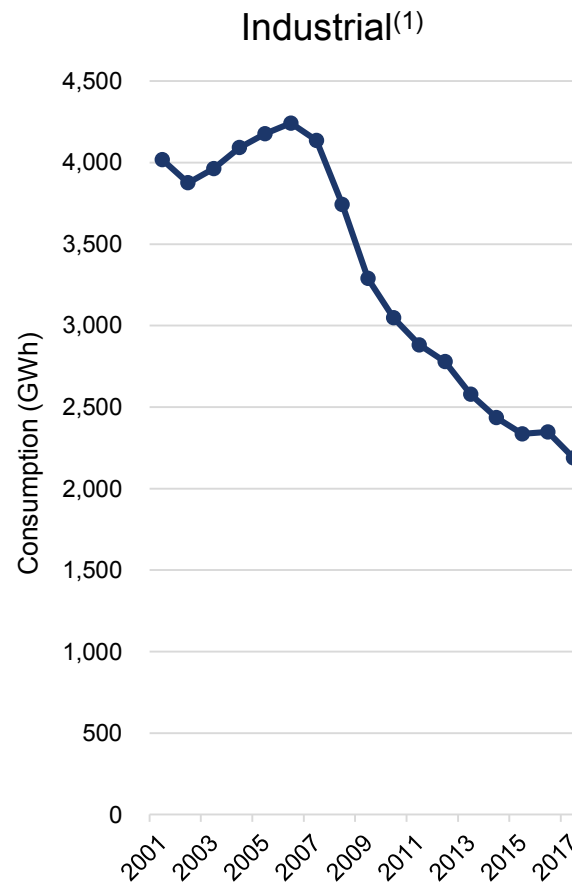
13% loss in demand in the residential sector since 2005 peak



10% loss in demand in the commercial sector since 2007 peak



48% loss in demand in the key industrial sector since 2006 peak

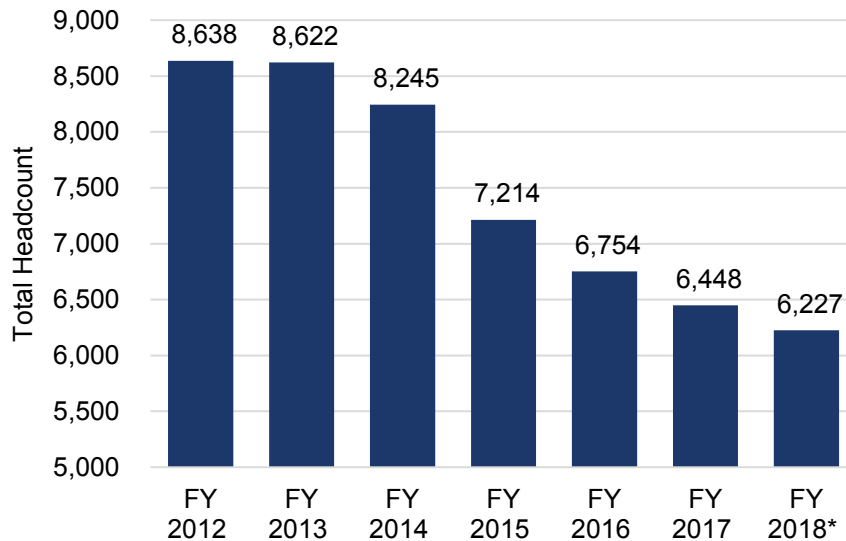


⁽¹⁾ Source: PREPA's rate records from 2000-2017

PREPA's Key Operational Areas Suffer from Understaffing and/or Sub-optimal Utilization of Available Human Resources

The loss of almost 30% of its workforce since 2012 has constrained PREPA's ability to respond to challenges

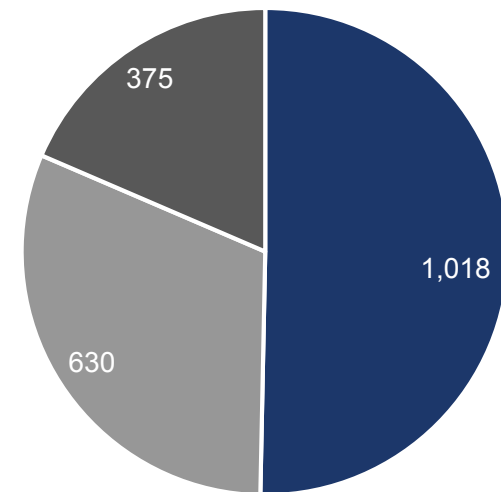
Annual Average Employee Headcount



*Latest Available as of December 2017

- 6,227 as of December 2017
- PREPA's headcount declined by 2,411 from FY 2012 to Dec 2017 – mostly due to retirement

Employee Retirements from 2012-2017



- Transmission & Distribution
- Generation
- Customer Service

- Of the 2,343 employees that retired between 2012 and 2017, 2,023 (86%) were from operations and 320 from administration

Source: PREPA Human Resources Directorate

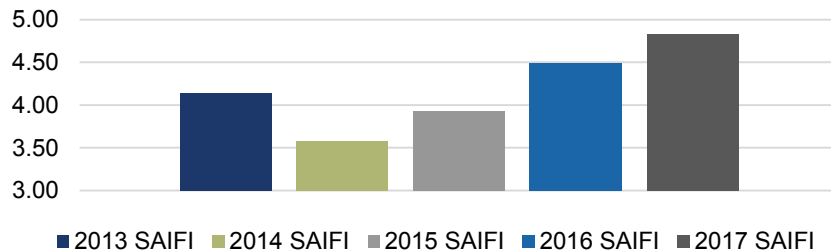
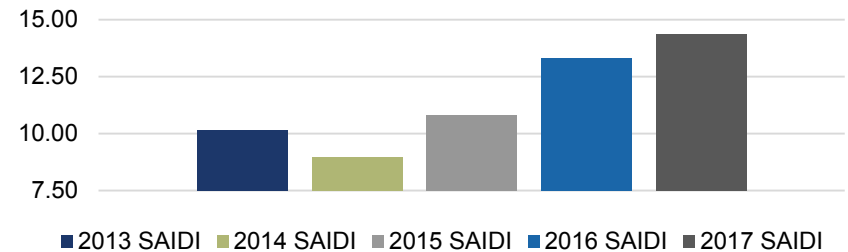
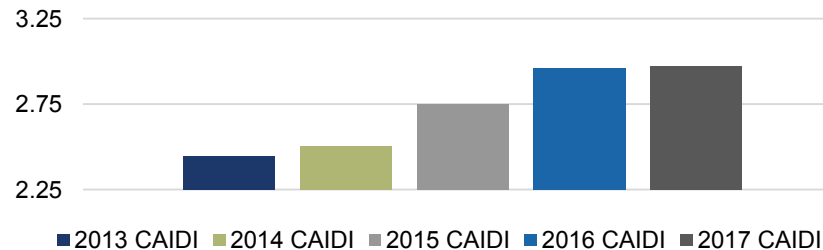


Even before the Hurricanes, PREPA's Reliability Metrics Compared Unfavorably to Industry Peers and were Trending Negative

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	FY 2017 PREPA	2016 North American Utility Peer Group			Comparison of PREPA reliability to median North American Utility reliability ⁽¹⁾
		Low Quartile	Median ⁽³⁾	Upper Quartile	
SAIFI	4.83	1.32	1.04	0.86	PREPA customers lose power almost 5 times a year on average
SAIDI	14.35	2.77	1.92	1.35	On average, PREPA customers do not have power for 14.4 hours
CAIDI	2.97	2.10	1.84	1.57	On average, when PREPA customers lose power it takes 3 hours to restore

PREPA Reliability Metrics 2013 – 2017 (excludes Impact of 2017 Hurricanes)

SAIFI 2013 – 2017⁽²⁾SAIDI 2013 – 2017⁽²⁾CAIDI 2013 – 2017⁽²⁾

- 1) PREPA data LTM as of July 2017, SAIDI/CAIDI are measured in hours and SAIFI is measured in # of occurrences
- 2) FY 2017 data projected based on prior year performance for August through December to exclude the impact of the hurricanes
- 3) Source of SAIFI, SAIDI and CAIDI North American utility data is the IEEE Benchmark report

Hurricanes Irma and Maria have Further Deepened PREPA's Critical State

- Hurricane Irma struck Puerto Rico's northern coastline on September 6-7, 2017, as a Category 5 storm, knocking out power to more than one million residents and impacting critical infrastructure
 - Within two weeks, PREPA restored service to approximately 70% of the affected customers, with others expecting to wait months for power to be restored
 - On September 20, 2017, Hurricane Maria, the fifth strongest hurricane to ever impact any portion of the United States, made landfall in southern Puerto Rico
- Hurricane Maria was a Category 4 hurricane with sustained winds of up to 155 miles per hour and up to 40 inches or more of rain in some regions
 - Hurricane Maria, the strongest hurricane to impact Puerto Rico since 1928, impacted all regions of the Island and severely interrupted 100% of the electric service on the Island
- PREPA took preparatory steps to activate its emergency response plan before the hurricanes and took additional steps immediately after the passage of Hurricane Maria, in an effort to re-establish power to its customers, including the development of an emergency response leadership hierarchy to manage the impending emergency response

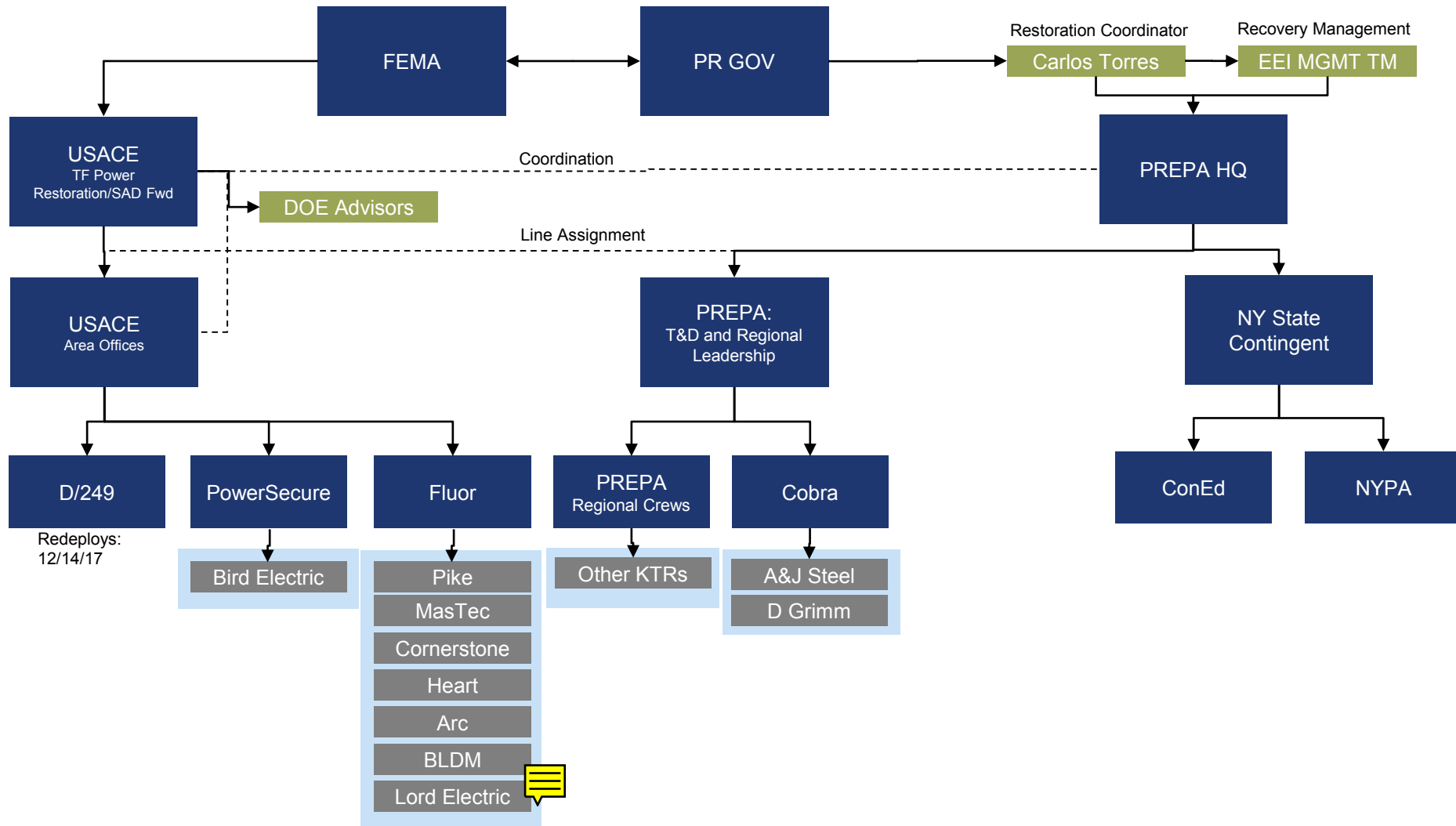
The impact of hurricane Maria on PREPA's electric grid and operations was catastrophic. It devastated PREPA's liquidity position and further exacerbated PREPA's overall critical condition, underscoring the urgent need for deep and permanent transformation of the energy sector in Puerto Rico.

III. Restoration and Revitalization

Power Restoration Process

Phase	Action Plan
Phase I Assess Damages and Restore Critical Infrastructure	▪ Preliminary assessment of damages & execute immediate repairs
	▪ Prioritize re-energization of critical infrastructure (hospitals, ports, potable water and water treatment infrastructure, and key government operations)
	▪ Integrate private contractors and USACE
	▪ Work with NYPA on completing initial damage assessment
	▪ Expeditiously engage with FEMA and other federal assistance agencies
	▪ Contract first responders for emergency line repairs
Phase II Stabilize System	▪ Restore key 230 kV loop from South generation sites to North load centers via Cambalache and Aguas Buenas
	▪ Power up Weston generators at Palo Seco to provide additional generation and stability in the North; Yabucoa generators in the East
	▪ Restore key 115 kV lines to critical load areas/regions
Phase III Connect Major Load	▪ Revise preliminary damage assessments and estimates for Generation and Transmission repairs
	▪ Continued onboarding of private crews in coordination with USACE
	▪ Restore IT, fiber optic, and related communications infrastructure
	▪ Establish Pharmaceutical Industry Association (“PIA”) Task Force – critical industrial/economic loads
	▪ Complete identification of regional industrial clusters around the Island and prioritization of line restoration plan of action
	▪ Focus on re-energizing key economic sectors (pharma central clusters/Act 154 entities, shopping centers, etc.)
Phase IV Mitigation	▪ Launch Power Restoration Task Force and designate Single Point Of Contact (“SPOC”) leader
	▪ Leverage PREPA contractors (local and stateside), USACE (stateside) to restore service, IT and client services. PREPA coordinating resource assignments and work schedules, geared towards re-energizing high load regions by targeting high load transmission centers
	▪ Remote Last Mile - identify remote areas and coordinate implementation of micro-grids and renewable technology
Phase IV Mitigation	▪ Identify system resiliency and rebuild needs in formal collaboration with Puerto Rico Energy Resiliency Working Group (PRERWG), PREPA Board of Directors, Central Government and FOMB
	▪ Must take into account implementation of sector transformation and structure and timing of federal funding

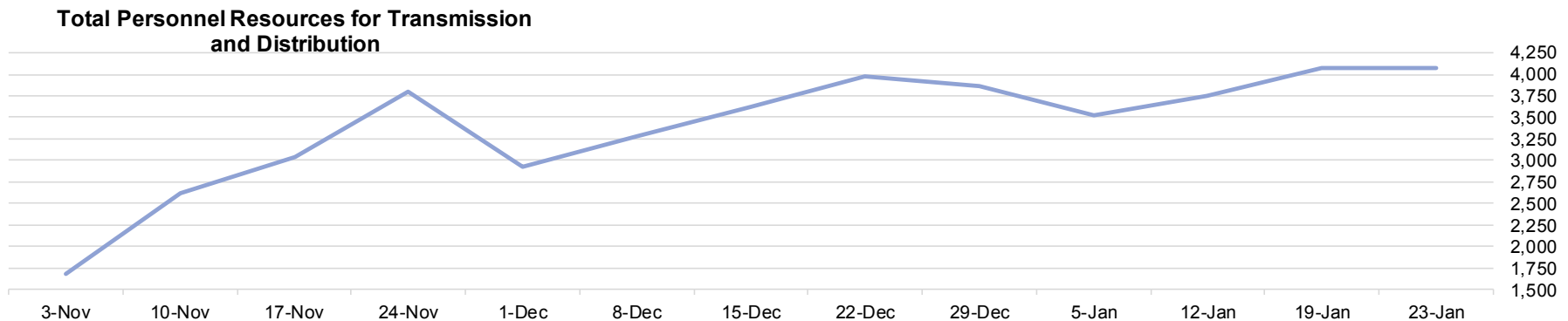
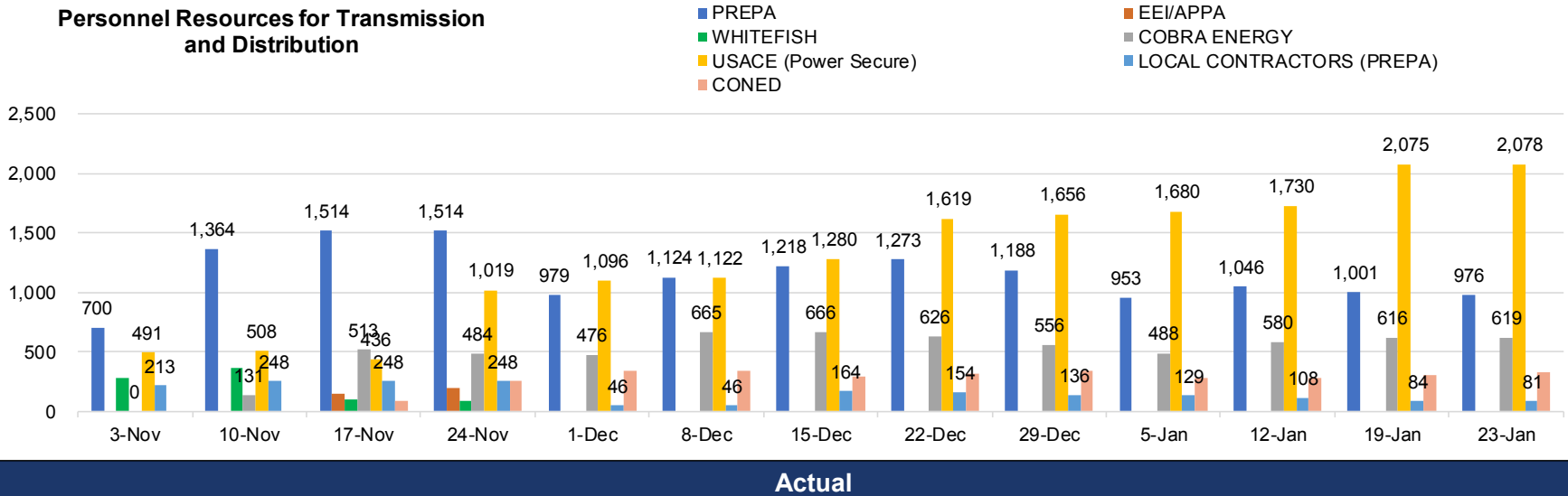
Power Restoration Task Force to Coordinate the Restoration Efforts



Source: Power Restoration Task Force Reports

PREPA and USACE are Implementing a Plan to have the Necessary Restoration Labor Resources on the Ground, Tracked on a Daily Basis

The overall headcount climbs as the USACE and its subcontractors increase their involvement

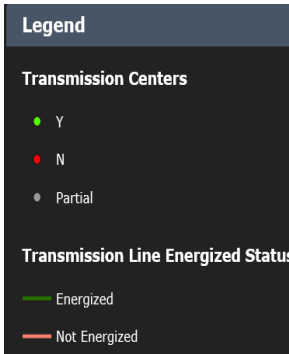


Source: 1/23/2018 Daily KPI Reporting Package (PREPA)

PREPA Tracks the Restoration Closely and Issues a Daily KPI Dashboard Report

As of 01/23/2018

- Certain charts, graphs and progress reports from a more comprehensive KPI Dashboard report are displayed for illustrative purposes
- PREPA Management reviews this information daily and utilizes it to track the restoration process



TRANSMISSION LINE STATUS



Progress of Critical Transmission Lines

Line	Voltage	From	To	Start	Finish	Complete	Remarks
50800	230	Yabucoa	Sabana Llana	6-Dec	11-Feb	75%	Stability and load
37800	115	MTC	Buen Pastor	30-Nov	31-Jan	86%	Powers water pumps
37800	115	Buen Pastor	Caguas	11-Dec	14-Feb	25%	
50200	230	Manati	Costa Sur S.P.	27-Nov	26-Jan	89%	System Interconnector
50700	230	Guayama (AES)	Yabucoa	4-Dec	1-Apr	24%	Power to the east
37400	115	Candelaria	Dorado	12-Dec	26-Jan	77%	Stability and load

SUBSTATIONS



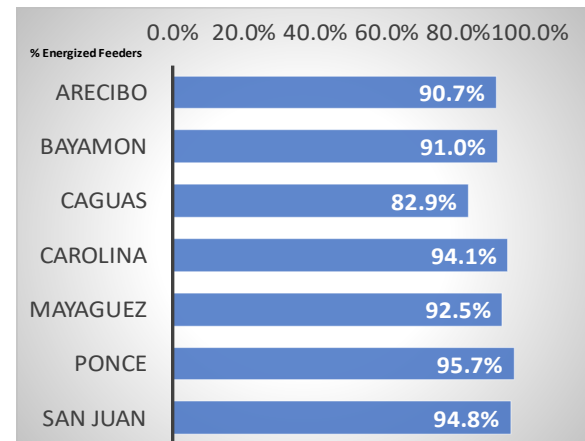
10-Jan	15-Jan	20-Jan	25-Jan	30-Jan	5-Feb
301	302	309			

TRANSMISSION CENTERS



1-Dec	15-Dec	1-Jan	15-Jan	1-Feb	15-Feb
40	40	40	40		

FEEDERS / BREAKERS ENERGIZED



* This does not imply connected customers.

One of the Key Challenges in Continuing Power Restoration Progress is the Need for PREPA to have Access to Funds for Repair and Restoration

Significant emergency federal funding is needed to alleviate PREPA's immediate liquidity need and to continue on a path to recovery and restoration




- FEMA grants are critical to emergency restoration and recovery
- Community Disaster Loans from the U.S. Treasury ("CDL") are also potentially available to address liquidity shortfalls from lost revenues but it is unclear whether and under what conditions a CDL would be available to PREPA (either directly or indirectly)

	CDL	FEMA Emergency Funding	Commonwealth Bridge
Key Principles	<ul style="list-style-type: none"> • The CDL is a new loan that is not automatically forgivable • Loan disbursements are for essential government functions only, which must be clearly identified to ensure no overlap with other Federal programs and which exclude material costs for which PREPA will remain liable • The CDL financing is a joint process with the U.S. Treasury (UST) and FEMA, requiring involvement of multiple parties, incl. GAR/OMB, FOMB, Public Corps, Title III court and PR legislature 	<ul style="list-style-type: none"> • Funds obligated by FEMA for emergency funding must adhere to FEMA guidelines • Completion of Project Worksheets (PW's) and submissions to FEMA are needed for advances / reimbursements of emergency spend • Must provide appropriate documentation supporting expenditures to ensure funds for emergency work do not get de-obligated • The G.A.R. (Government Appointed Representative) is the Grantee and PREPA is the Sub-Grantee 	<ul style="list-style-type: none"> • Bridge loans to cover essential current and near-term government functions in advance of a CDL • Constrained by funds available in TSA account
Structure	<ul style="list-style-type: none"> • "Multi-note" structure with staged borrowing • Possibility of direct and indirect funding (i.e., UST can determine whether to fund directly to PREPA or through the central government) • May be required to be repaid upon confirmation of plan of adjustment or transformation transaction 	<ul style="list-style-type: none"> • PREPA prepares information for PWs and GAR submits to FEMA • FEMA obligates funds and transfers them to an account that the GAR has access to • PREPA submits expenditure documentation to the GAR who approves and releases funds 	<ul style="list-style-type: none"> • Loans from central government with TBD seniority • Staged borrowing corresponding to liquidity needs • Intended to be rolled into / repaid by CDL on CDL execution
Next Steps	<ul style="list-style-type: none"> • Negotiate terms, documentation, and structure • Obtain required consents 	<ul style="list-style-type: none"> • Prepare and submit PWs on a timely basis • Establish cadence for PW and actual expense documentation submission • Engage with GAR and confirm structure for funding mechanism • Obtain necessary documentation to minimize the risk of FEMA fund de-obligation 	<ul style="list-style-type: none"> • Finalize terms and documentation • Legislation to be submitted for approval • Obtain required consents



The Governor of Puerto Rico and PREPA have Instituted a Structure for Enhanced Transparency and Compliance in Procurement Activities

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Process	Approach	Accomplishments to Date
 <div>Independent Review</div>	<ul style="list-style-type: none"> Perform independent technically expert reviews to confirm that PREPA contracts and procurement actions are compliant with all applicable federal and Puerto Rico procurement and reimbursement requirements. 	<ul style="list-style-type: none"> Reviewed and provided mitigation plans for over \$100 mil of PREPA procurement activity Implemented contract review procedure
 <div>Controls</div>	<ul style="list-style-type: none"> Implement procurement process controls and procedures to mitigate compliance risk, limit funds deobligation risk, enhance accountability, and increase the efficiency and reliability of PREPA contracts and procurement actions. 	<ul style="list-style-type: none"> Conducted initial risk assessment of PREPA procurement controls Provided analysis and support for PREPA responses to FEMA and FOMB queries
 <div>Integration & Transparency</div>	<ul style="list-style-type: none"> Implement process enhancements, including process automation and integration, monitoring and reporting systems, and increased sourcing options to increase the accountability, transparency, and effectiveness of PREPA procurement. 	<ul style="list-style-type: none"> Implemented daily coordination and weekly reporting with key PREPA and Puerto Rico leadership stakeholders Initiated federal GSA access plan for PREPA

OCPC Team Organization

- OCPC Leadership** coordinates all OCPC components, reports to leadership on progress, and issues determinations as to whether reviewed contracts are compliant or non-compliant with applicable laws.
- Procurement & Grants Legal Experts** define all applicable procedural and substantive legal requirements (Federal, Government of Puerto Rico, etc.), and provide legal advice regarding legal compliance. The Procurement Legal Experts also supervise conduct of any necessary investigation activity and coordination with any OIG request.
- Procurement & Grants Technical Assistance Expert** ensure processes and contracts comply with applicable procurement requirements, identify and address compliance issues, conduct necessary audits, and help optimize a compliant procurement process.
- Office Administration Function** assist with OCPC coordination and perform administrative functions.
- Integration, Monitoring, and Reporting Function** monitor and report performance data and facilitate integration of OCPC process into related procurement enhancement initiatives.



PREPA Customer Billing Process Update: Current State and Key Issues

Communications equipment damaged in the storm materially impacted PREPA's billing process

- PREPA has primarily used Automatic Meter Readings (AMR) for the past 15 years
- Communications equipment damaged during Maria is prohibiting PREPA from being able to bill its customers
 - 161 substations have communications as of January 9th
 - 181 substations do not have communications as of January 9th
- In the normal course, when a remote meter reading does not occur, PREPA issues an estimated bill
 - At the Governor's request, following the storm, PREPA is not issuing any estimated bills
 - In the absence of issuing estimated bills, there are three ways for a meter to be read so that a bill can be issued:
 1. **AMR Restored**
 - Approximately 32% of PREPA customers as of January 9th
 2. **PREPA customer service employee reads the meter and inputs into the CCB billing system**
 - 135 employees are manually reading meters for approximately 9,000 primary (industrial) accounts and approximately 1.2 million secondary (commercial and residential) accounts
 3. **PREPA customer sends photographic evidence of meter to PREPA customer service team which inputs into the CCB billing system**

Source: PREPA Customer Service Directorate



Billing – Plans to Ramp up Restoration of Billing Process

Short-Term Approach

- In lieu of remote meter readings, PREPA plans to manually read meters during the next 90 days using 135 customer service personnel
- To increase billing and improve cash flow, PREPA is prioritizing manual reads for the ~9,000 primary (industrial) accounts over the ~1.2 million secondary (commercial and residential) accounts

Longer-Term Approaches

(All 3 plans conducted simultaneously)

- **Plan A** - Form cross functional team to prioritize rebuilding actions to restore pre-hurricane communications system
 - Team formed using personnel from the communications, customer service, IT and T&D departments
- **Plan B** - Install AT&T hotspots at energized substations not communicating with PREPA data center
 - Initial high level estimates assume an up-front cost of \$1M
 - As of January 5, 2018, PREPA's Customer Service department had purchased the hotspots and was working with AT&T to set up delivery of the equipment
- **Plan C** - Bypass the data center by taking laptops with access to the billing system to energized substations in order to get direct readings from the substation communication equipment
 - Would require travel of key personnel to the energized substations, or
 - Alternatively, would require training and software purchases for the field to start assisting with this plan

Source: PREPA Customer Service Directorate

Roadmap for Recovery and System Resilience

PREPA has developed a roadmap to protect critical loads and enhance overall system reliability through enhancement of system interconnectivity, improvements to infrastructure design and construction criteria, and establishment of electric system islands (a.k.a. micro-grids).

- Projects must meet at least three fundamental planning, design, and operational criteria:
 - Enhance system stability and power service continuity during a major atmospheric event
 - Contribute to black-start capability of the electrical system
 - Improve power system restoration process and capability
- Infrastructure projects were identified to increase the resilience of the electrical grid
 - Key underground 115 kV and 38 kV transmission circuits, connecting critical loads (e.g. Metro Zone)
 - Gas Insulated Substations (GIS) to replace old, unreliable oil insulated substations
 - Existing transmission line inspections, maintenance, and reconstruction
 - Electrical system islands that isolate critical loads and / or have key infrastructure in place
 - Requires black start capability
 - Sufficient conventional generation, renewable generation, or both, along with adequate controls to operate reliably and independently until normal operation conditions return
 - Existing generation, such as existing 20 MW turbines, hydroelectric plants, private generation, or new generation can be used to power these islands

IV. Fiscal Plan Implementation

Fiscal Plan Implementation

Impediments

- For reasons within and outside of its control, PREPA has historically been unable to implement a business plan that leads to the lowest possible energy rates for Puerto Rico's ratepayers or achieve compliance with environmental regulations.

Transformation

- On January 23rd, the Governor of Puerto Rico announced the plan to radically shift from the current energy sector model by enacting deep energy sector reform that fully leverages private market expertise, know-how and investment in order to promote the lowest possible rates and compliance with applicable environmental regulations. **The terms and amount of federal funding available to support such a transformation may materially impact the structure of the transformation.**

Recovery

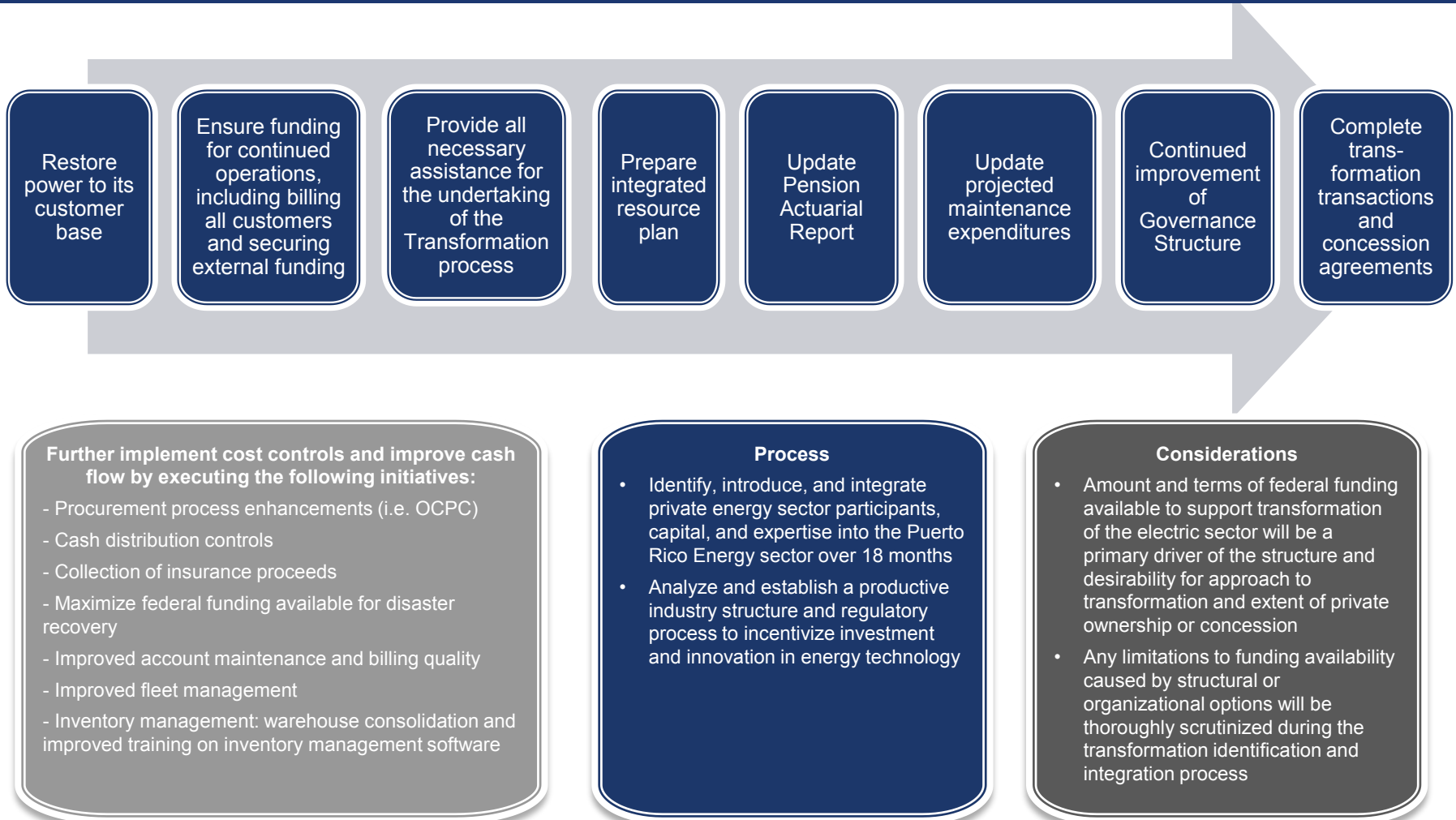
- As part of the energy sector reform, the Government of Puerto Rico intends to put in place safeguards and rate regulation to protect ratepayers and ensure the development of a world class energy system via the establishment of the appropriate regulatory framework (i.e., with clear and transparent KPIs, targets and milestones, including right-sizing operational costs for the new demand environment; delivering projects efficiently across asset planning, procurement, and construction; and lowering long term maintenance costs while increasing reliability through predictive maintenance strategies).

Outside Help

- The need for deep energy sector reform and access to private capital dictates that the transformation of the energy sector in Puerto Rico occur outside of PREPA's current structure. The transformation of the electric sector in Puerto Rico is anticipated to involve a sale of the existing generation assets, development of new generation and a concession by the public entity of the T&D, as set forth in Appendix A.
- Puerto Rico's ability to execute on the transformation of the energy sector and the ultimate structure of any such transformation may be impacted by the amount, structure and terms of the federal funding available to support the transformation.

PREPA has Identified Important Work Streams that it will Execute Over the 18-month Transformation Period

PREPA will undertake or complete the following tasks over the Transformation Period:

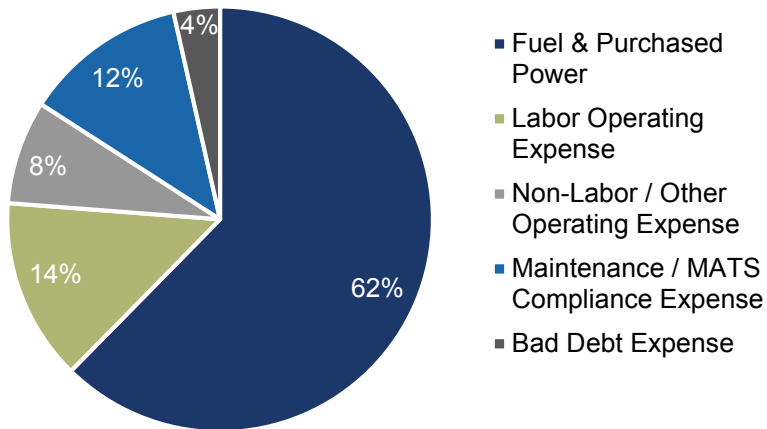


V. Aspirational Operational Initiative Details

PREPA will Seek to Implement Operational Savings Initiatives, although Current Operating Expense Profile and Recent Attritions Constrain Savings Opportunities

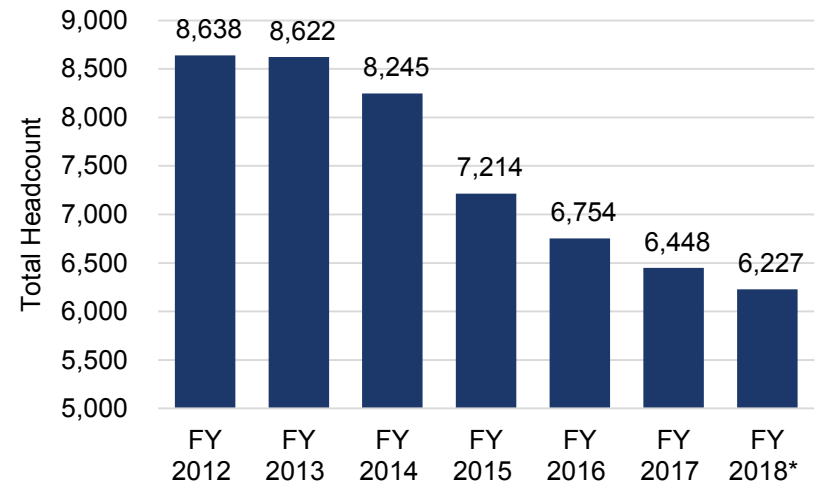
Approximately 30% of PREPA's operating expenses have actionable components

- Headcount has fallen by 30% since 2012 and PREPA is currently facing an additional exodus of critical employees
- Cost reduction opportunities are limited, due to significant cost reductions in operations, retirement system funding needs, historical underfunding of maintenance, and the fact that over 62% of PREPA's costs are controlled by external factors
- Third parties⁽¹⁾ have found that "PREPA's operating expenses (net of fuel and purchased power expenses) are 30% to 40% below those of mainland U.S. electric utilities"



Source: Headcount and other figures provided by PREPA Human Resources Department (Dec 2017)

Annual Average Employee Headcount⁽²⁾



*Latest Available as of December 2017

1) Testimony by Dr. Lawrence Kaufmann before the Energy Commission Rate Case proceedings. See Ex. 6 of PREPA Rate filing

2) FY2017 figure includes data through June 30, 2017.

Note: As part of its generation plan, PREPA is seeking to implement an energy diversification strategy to stabilize price volatility exposure in the long term.

Historic O&M Spending has been Insufficient to Maintain a Safe and Reliable System

PREPA's O&M spend is lower than its peers in the U.S., even after adjusting for salaries. Underspending and delayed maintenance have exacerbated the need to repair and restore system infrastructure to minimum industry acceptable levels

	<u>Bottom Quartile</u>	<u>Median</u>	<u>Top Quartile</u>
IEEE Salary Survey U.S. Utilities			
Total Compensation	\$88,700	\$114,000	\$140,000
PREPA FY17 Payroll Data			
Total Compensation	\$67,236	\$73,354	\$81,272
Variance to IEEE	-24%	-36%	-42%

Source: IEEE Salary Survey, PREPA Finance

- PREPA FY 2017 O&M per employee and per customer is shown Unadjusted and Adjusted* to reflect an increase in labor costs by 36% to meet median IEEE salaries and normalize for differences in labor costs between Puerto Rico and US mainland utilities
- Even on an adjusted basis, PREPA's relative O&M spend is below comparable US mainland
- To make up for years of underspending, PREPA is adjusting headcount and maintenance expenditure to meet critical needs including urgent environmental, health and safety upgrades. PREPA will assess the impact of rebuilding efforts and related federal funding
- PREC approved increased spending for labor in the Generation, Transmission & Distribution directorates in its Final Resolution and Order (Sep 2016)

	O&M per Employee	O&M per Customer
Edison International	\$ 231,477	\$ 568
FirstEnergy Corp.	\$ 245,623	\$ 642
IDACORP, Inc.	\$ 174,723	\$ 665
NextEra Energy, Inc.	\$ 230,544	\$ 700
El Paso Electric Company	\$ 280,691	\$ 756
Cleco Corporate Holdings LLC	\$ 180,909	\$ 758
Pinnacle West Capital Corporation	\$ 143,764	\$ 765
American Electric Power Company	\$ 237,870	\$ 777
Hawaiian Electric Industries	\$ 102,173	\$ 845
Great Plains Energy Incorporated	\$ 294,695	\$ 992
Comparable Utility Company Average	\$ 212,247	\$ 747
PREPA FY17 – Unadjusted	\$ 119,769	\$ 528
PREPA FY17 – Adjusted* to IEEE median	\$ 157,245	\$ 693
PREPA FY18 Budget	\$ 173,133	\$ 843

Source: SNL Energy – Most Recent Reported Fiscal Year: 2016



Aspirational & Potential Cost or Rate Reducing Operational Initiatives

Annual estimated impact

The operational initiatives presented below could potentially be executed to achieve lower overall costs and rates. Operational initiatives must be viewed in light of historical challenges to execute on initiatives consistently and successfully given the political and economic environment.

Potential Performance Improvements

Reduce fuel consumption by increasing low-cost, market-rate renewable capacity

Reduce fuel cost by reducing forced outages and increasing plant availability

Behind the meter/net metering revenue recovery / subsidy reduction

Public lighting efficiency improvements with LED P3

Reduce Non-technical-losses

Implementation of Act 26 - 2016

Process improvements to increase labor productivity

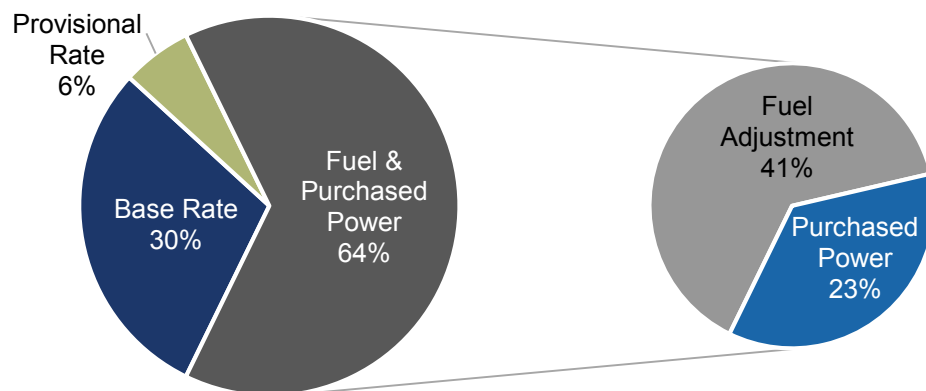
Simplify organizational structure

Improve customer service responsiveness and collections



VI. Rate and Regulatory Structure

Current Rate Structure Overview



PREPA's current rate structure is composed of four primary components – Base Rate, Provisional Rate, Fuel Adjustment and Purchased Power

The 3 primary categories of customers make up 96% of revenue - Commercial (47%), Residential (37%) and Industrial (12%)

PREC approved a permanent rate structure that has yet to be implemented that would eliminate the 11% surcharge construct and instead include direct pass through line items in customer's bills to cover CILT and subsidies

	Residential	Commercial	Industrial	Comments
Base Rate Revenue (cents per kWh)	5.30	6.75	4.68	Intended to cover PREPA's O&M, and has not changed since 1989. Includes fixed charge (\$3) for clients on secondary distribution, and demand charges for clients served by primary distribution and transmission.
Provisional Rate Revenue (cents per kWh)	1.20	1.27	1.22	Authorized by PREC to cover PREPA's O&M deficit (\$222MM as of August 2016) during the pendency of the permanent rate case.
Fuel Adjustment Revenue (cents per kWh)	8.58	8.60	7.93	Includes 11% surcharge intended to cover CILT + subsidies authorized by law
Purchased Power Revenue (cents per kWh)	4.84	4.79	4.52	Includes 11% surcharge intended to cover CILT + subsidies authorized by law
Total Revenue (cents per kWh)	19.92	21.41	18.35	
Avg. Client Bill per Month	\$87.50	\$1,202	\$60,105	
Share of Revenues per customer class (%)	37%	47%	12%	

PREPA and Future Private Owners Will Require a Reasonable Regulatory Process

The annually updated and reconciled Formula Rate Mechanism (“FRM”) proposed by PREPA and rejected by PREC bases rates on Fiscal Plan budgets, and most effectively implements the plan while preserving review and oversight

Costs	Liquidity	Sales
<ul style="list-style-type: none"> FRM bases rates only on real and necessary costs Rates would be updated based directly on Fiscal Plan budgets Rates will automatically adjust for other sources of emergency funds Actual costs reviewed and reconciled after the fact 	<ul style="list-style-type: none"> Helps address the ongoing challenges of having no access to capital markets and few reserves, while needing to make essential investments in recovery, environmental compliance Avoid/minimize historical undue political influences 	<ul style="list-style-type: none"> Annual reconciliations address changes in sales/demand, protects customers from forecast errors and remove disincentives from reaching efficiency gains and renewable energy deployment

Annual Rate Update Process and Challenges with the Puerto Rico Energy Commission (“PREC”): **PREC rejected PREPA’s FRM proposal**, adopting instead a plan not tied to the approved Fiscal Plan (in contravention of PROMESA and otherwise applicable law) that attempts to improperly take over effective control of PREPA’s operations, budgets, and priorities

Key Challenges

- PREC consistently tries to assert direct and **excessive operating control** over PREPA, well beyond traditional rate and IRP review, including areas where PREPA is implementing government policy or the approved government Fiscal Plan
- PREC asserts jurisdiction over PREPA budgets and spending / investment even when approved by the FOMB
- PREC process does not respect, and imposes timelines inconsistent with, PREPA’s operating or budget needs
- PREPA approved no robust annual reconciliation process to address ongoing changes in budgets, costs, and sales; rather, adjustments for changes require extraordinary action or PREC permission prolonging processes and timelines
- PREC denied PREPA’s requests to reconsider its Order regarding some aspects of the annual rate update mechanism, including budgeting and rate adjustment timelines
- PREPA has appealed aspects of PREC’s order to the P.R. Appeals Court and will propose a PROMESA-linked FRM and updated rates consistent with the FOMB-approved Fiscal Plan

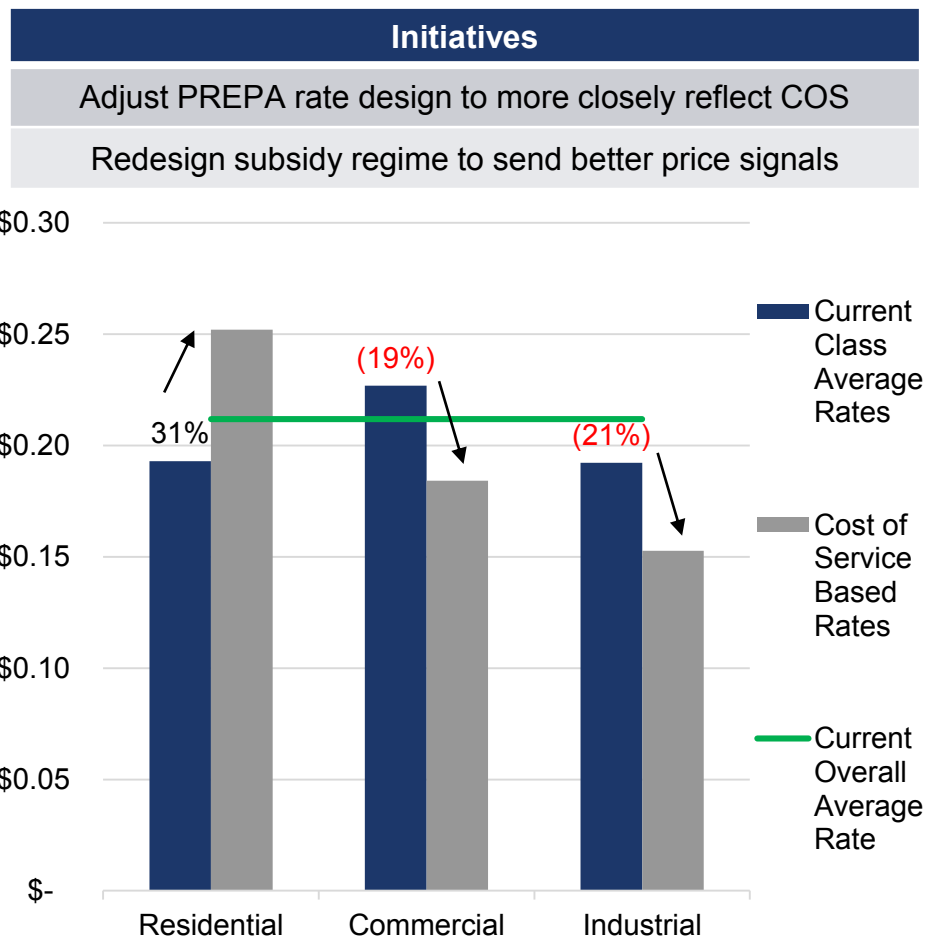
PREPA's Current Rates Do Not Send Effective Price Signals

PREPA's current rate structure does not send effective price signals to customers and is potentially economically deflationary – there is no incentive to increase efficiency or impetus to reduce expenditure on high cost refined fuels for generation, which results in a greater-than-necessary transfer of resources to off-island interests.

- In most economically and regulatorily developed jurisdictions, average electric power rates are lower for industrial and commercial customers relative to residential customers, consistent with the relative per kWh Cost of Service (COS).
- In no U.S. state is the rate for industrial or commercial higher than residential, as it is in Puerto Rico. This is mainly due to the heavy subsidization of certain PREPA residential classes, which discourages energy conservation and efficiency.

Region (cents per kWh)	Res	Comm	Indu
East North Central	13.1	10.0	6.9
East South Central	10.9	10.2	5.8
Middle Atlantic	15.7	12.5	7.0
Mountain	11.7	9.5	6.4
New England	18.8	15.2	12.2
Pacific Contiguous	14.6	13.3	8.9
Pacific Noncontiguous	24.4	21.3	19.2
South Atlantic	11.6	9.2	6.5
West North Central	11.8	9.5	7.1
West South Central	10.6	8.2	5.3

Source: EIA-861 Annual Survey Data



Source: PREPA Embedded Cost of Survey Study



Puerto Rico
Electric Power
Authority

Rate Design Challenges & Opportunities – Stranded Costs Recovery

In the event that the Transformation Plan is not successfully executed, there are well-understood ratemaking and regulatory responses used by utilities faced with serious threats of uneconomic bypass and stranded costs.

- **Adopt economically efficient rate designs.** Uneconomic incentives to bypass utility supply or delivery can be avoided or minimized:
 - Properly reflect fixed and volumetric costs in rates, and properly assign costs to classes
 - Move more costs, especially fixed network costs that do not change with customers' use, to fixed values, than to volumetric costs to reduce volatility and discourage inefficient bypass
 - Consider unbundling delivery and supply rates and costs. This can help protect essential grid cost recovery and preserve funding for grid improvement and “future utility” goals. Rate unbundling also facilitates private generation investment
 - Rates that discount delivery prices without reducing grid costs must be carefully designed to promote the desired social goal (e.g., promoting renewable energy) without stranding grid costs or creating cross subsidies that hurt customers least able to respond, who are often low income or low use
- **Use targeted rate tools.** Customer or group-specific rate tools such as economic development rates, load retention rates, and special customer class (e.g., very high voltage, interruptible) rates can reduce the risk of uneconomic load loss and attract new load to areas where capacity (T&D and Generation) is available at little marginal cost. This helps the utility and the economy
- **Explicit stranded cost charges.** Impose non-bypassable charges on customers designed to recover identified categories of stranded costs. In extreme cases, stranded cost can even be recovered from customers who go entirely off grid or who depart. In some cases, a non-bypassable charge can reduce the incentive to depart as a means of avoiding responsibility for stranded costs

VII. Macro Resource Planning

Integrated Resource Plan (“IRP”)

Background

- PREPA is required, under Puerto Rico Act 57 of 2014, to prepare an IRP that analyzes and identifies its preferred strategy for satisfying system requirements over the planning horizon
- Main factors addressed in the IRP are reliability, stability, environmental compliance, and future renewable generation levels under market, regulatory and economic constraints
- The best performing portfolio is recommended taking into account cost, reliability, and environmental considerations based on the results of system and production cost modeling in PROMOD and PSS®E

As part of the Build Back Better initiative, PREPA will re-examine the capex plan embedded in the 2015 IRP

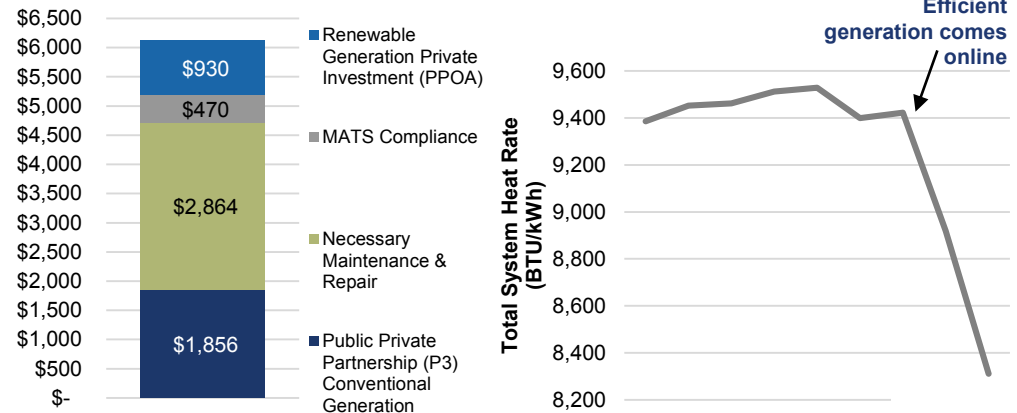
- A re-examination of PREPA’s current IRP is desirable in light of factors like the impacts of Hurricanes Irma and Maria, lower demand forecasts, increased estimates for distributed generation, and rapidly declining costs for renewables, in order to assure that planned investments are still necessary and cost-efficient
- The need to re-build the system due to the damages caused by Hurricanes Irma and Maria represents a unique opportunity to leverage locally available renewable energy sources and battery storage capacity and lower the dependence on external sources of fuel

Assessment and Development of a Sequenced Roadmap for Achieving MATS Compliance and Generation Modernization is Underway

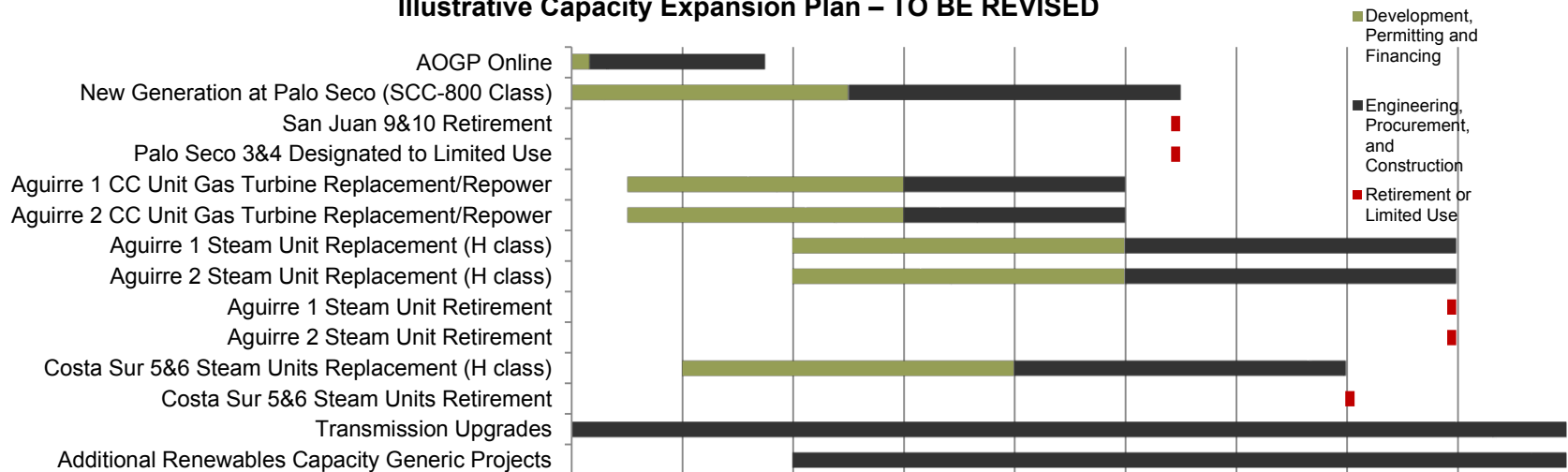
PREPA must now reassess its 10-year capital spending plan: \$6.1B of necessary maintenance & repairs and capital investments to ensure MATS compliance and reliable, efficient generation.

Long term power system goals still include:

- Retirement of old and inefficient units, and repowering and replacement of generation assets through privatization to reduce fuel expense, system heat rate, and exposure to volatile fuel prices, and to improve system flexibility to integrate renewable resources
- Construction of the Aguirre Offshore Gas Port and Aguirre plant conversions to natural gas to ensure MATS compliance strategy and complete the shift to clean, low-cost, and fast response natural gas generation
- T&D maintenance to ensure that the electric grid is safe, reliable, and capable of handling variable load and generation from renewables and DG

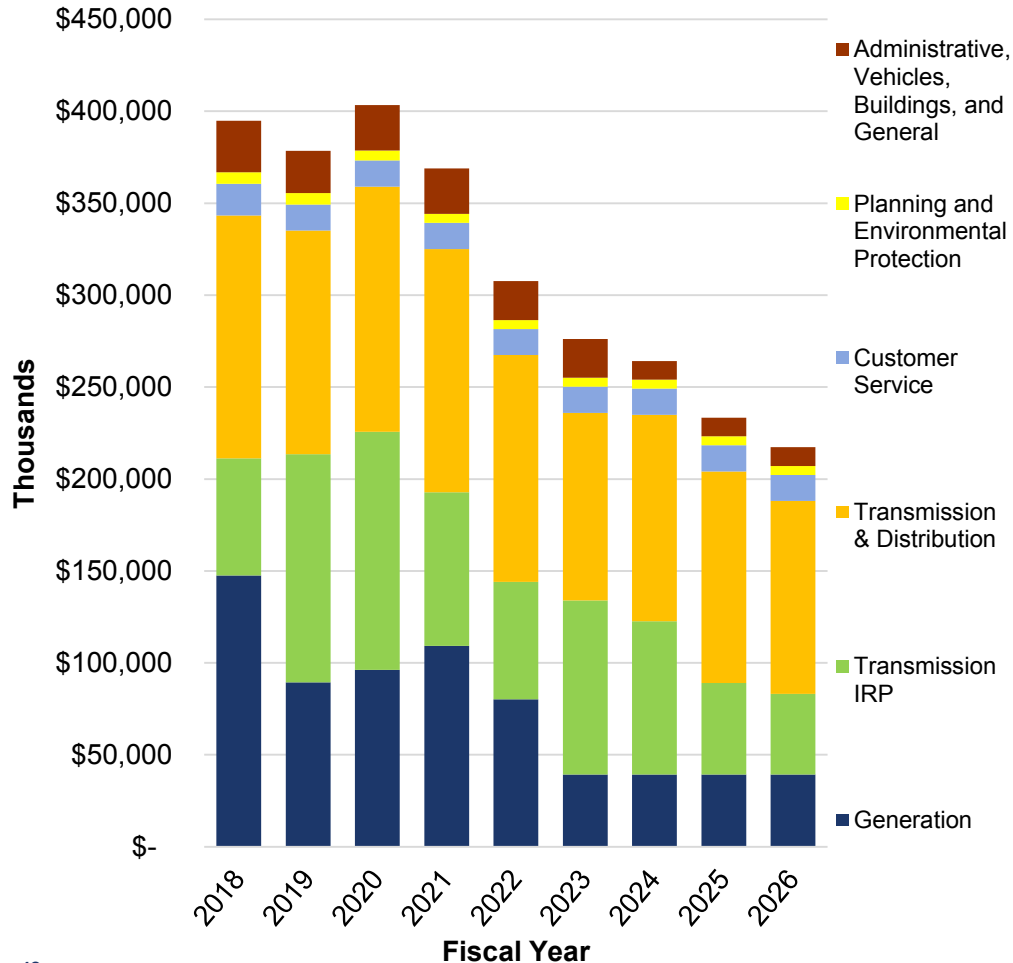


Illustrative Capacity Expansion Plan – TO BE REVISED



As Part of the 2013 IRP Process, PREPA Identified Significant Near and Long Term Maintenance Program Spending Requirements for Safety and Reliability, which Needs to be Reassessed as Part of the Updated IRP and “Build Back Better Puerto Rico” Initiative

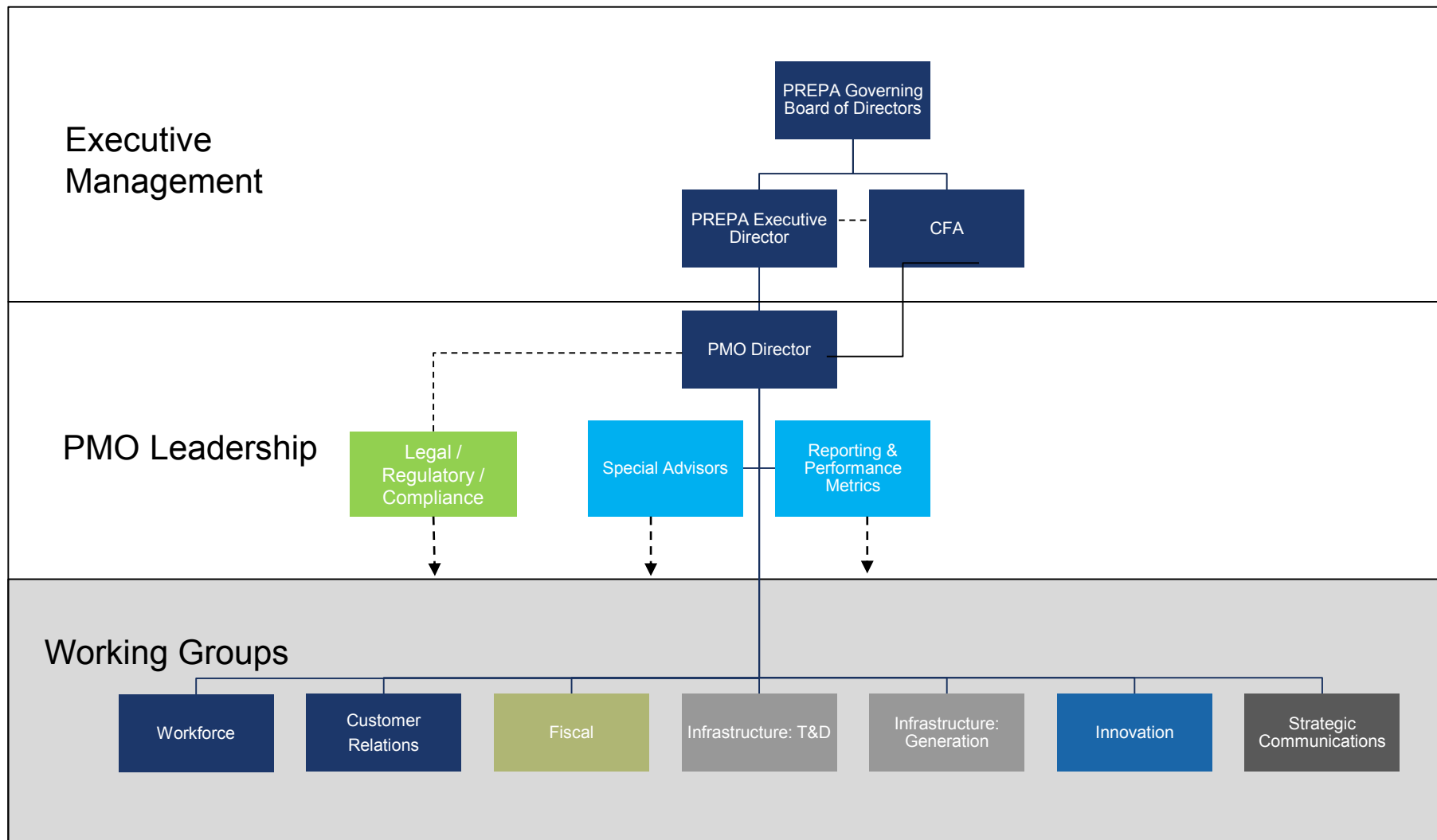
Inadequate levels of maintenance have left the energy grid system in need of significant near term repair. PREPA Directors and the Planning department have identified and prioritized projects that are mandatory by law or necessary to maintain minimum system safety and reliability for the planning horizon. Given the impact of the hurricanes and the ongoing rehabilitation work undertaken on the T&D system, PREPA will re-evaluate future T&D maintenance needs.



- Generation maintenance required for PREPA’s generation fleet includes steam boiler unit repair, turbine blade refurbishment, water intake and effluent management system maintenance, and other critical equipment and infrastructure to keep units in safe operating condition
- Transmission IRP projects are major repairs and refurbishments to 230kV, 115kV, and 38kV lines (which are being re-assessed as part of the rebuild results and updated IRP)
- Transmission & Distribution projects are ordinary course necessary maintenance projects to repair and refurbish substations, poles, wires, connection hardware, insulators, and other critical equipment and infrastructure
- Customer Service maintenance projects are primarily acquisition and installation of new meters to replace broken and obsolete units
- Planning, Environmental Protection, and Administrative maintenance projects cover repairs to buildings, replacement of vehicles, necessary environmental studies, and measurement equipment

VIII. Governance

Governance Structure at PREPA Until Energy Sector Transformation



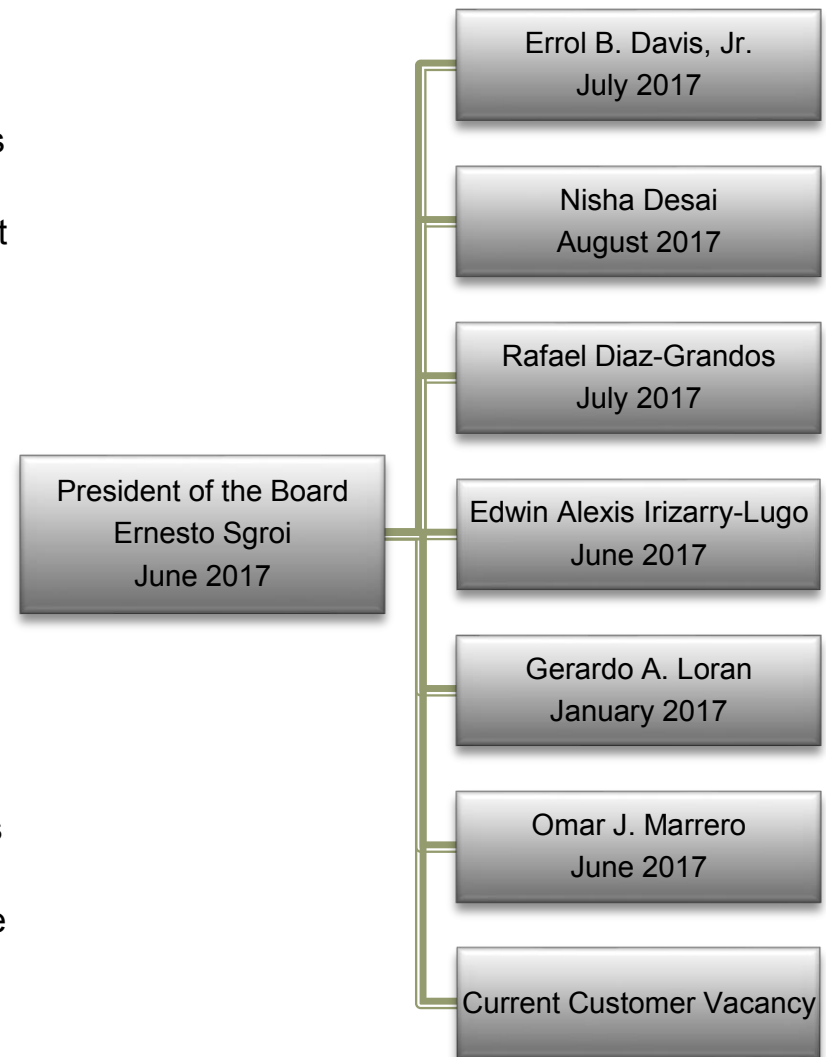
Governing Board

Board Composition:

- Similar to the Senior Management of the Company, the Governing Board of PREPA is made up of individuals who have served for less than one year in their current positions
- The Governing Board currently consists of eight members, with one current vacancy for a customer representative that will be filled in an upcoming popular election
- BOD composition includes a mix of Governor appointees and politically independent members
- Four of the five BOD committees are chaired by an independent member and/or constitute a majority of the committee, including the Finance and Audit Committee which is exclusively composed of independent members

Current Focuses Include:

- Power restoration and recovery
- Near-term liquidity challenges spawned by the recent storms
- Improving PREPA's overall transparency and credibility
- Enhancing internal human capital capabilities and business processes
- Retained Heidrick & Struggles to search for new CEO (note title is not executive director), search committee is composed of three independent directors



Governing Board Profiles

Ernesto Sgroi, the President of the PREPA Governing Board manages and advises on retail, commercial and tourism asset portfolios for local and foreign investors in Puerto Rico. Mr. Sgroi is the former Chief Financial Officer of the Puerto Rico Tourism Company & Puerto Rico Convention Center District Authority where he was responsible for oversight of the tourism and investment portfolio and led the negotiations and structuring of new projects. Previously, he was an Advisor to the President, Government Development Bank for Puerto Rico where he was directly involved in the sale of government assets to the private sector, including health care facilities, hotel properties, correctional institutions and a telecommunications company. Mr. Sgroi is intimately familiar with the process of developing and monitoring operational budgets of various government corporations, as well as the management of reporting requirements to state and federal government agencies.

Errol B. Davis, Jr., is a Senior Advisor to TalentQuest, a firm specializing in Board reviews, executive coaching, management training, leadership development and succession planning. Mr. Davis was most recently superintendent of Atlanta Public Schools, serving from July 2011 through July 2014, and he served as the chancellor of the University System of Georgia from January 2006 until June 2011. Previously, Mr. Davis served as chairman of the board of Alliant Energy Corporation from 2000-2005, after joining the company in 1998 as president and chief executive officer. Prior to the creation of Alliant Energy, he served as president and CEO of WPL Holdings, from 1990 to 1998. From 1978-1990, Mr. Davis rose through the senior management ranks at Wisconsin Power and Light Company, starting as vice president of finance and ending as CEO and president. Mr. Davis is currently on the Board of Directors of Union Pacific Corp. and the Public Broadcasting System (PBS).

Nisha Desai, is the managing director of Aurora Clean Energy Partners, a provider of growth strategy, business development, and project development services in renewable energy and clean technology. Previously, Nisha served as the Vice President, Distributed Generation for NRG Energy. In that position, she led a team of project development and engineering professionals to identify and create resilient and sustainable on-site energy solutions for commercial, industrial and institutional clients. Prior to NRG, Nisha had a number of leadership roles in the energy and water industries, with a significant focus on business model and technology innovation. Her development expertise included solar power, water infrastructure, energy storage, CHP, and fuel cell projects. Nisha has also served several years as a management consultant with Booz & Company's energy practice, and she has held finance and business development roles with Enron and Mobil. She holds an economics degree from Yale and MBA from Harvard Business School, where she was an American Association of University Women Selected Professions Fellow.

Governing Board Profiles

Rafael Diaz-Grandos, is an accomplished Fortune 10 senior executive, experienced in consistently driving transformational change in key operating units, and growing, restructuring and optimizing international businesses. During his career at General Electric, he transformed several business operations, including GE Healthcare where his team drove the transformation of GE's \$18 billion healthcare business, instituting a completely new organization structure and operating mechanisms, all while reducing costs by over \$1 billion. Prior to this, Rafael served in regional and country leadership roles, as Chief Commercial Officer, GE Latin America, as President and CEO, GE Spain and Portugal, and as President and CEO, GE Mexico. In these roles, Mr. Diaz-Grandos focused primarily on all aspects of the energy business, from power generation to transmission and distribution, as well as project financing. In Europe and in Latin America, he led a multi-billion dollar investment in both renewable and combined-cycle energy projects. These projects included utility-scale solar and wind farms, distributed energy, CHP co-generation projects and large 500 to 800 MW combined cycle installations. During his tenure as CEO of GE Mexico, GE was a key partner of CFE (the Comisión Federal de Electricidad, Mexico's largest electric utility), in issues ranging from IPP projects, to the repowering of Laguna Verde, CFE's only nuclear power plant. As CEO of GE in Spain and Portugal, Mr. Diaz-Grandos worked closely with key clients like Iberdrola, ACS and Abengoa on international power projects, as well as with Red Electrica de España on smart grid issues created by the influx of renewable energy.

Edwin Alexis Irizarry-Lugo, Esq., specializes in providing legal representation related to environmental, construction and land use law. Mr. Irizarry-Lugo also provides consulting services as a professional engineer. From December 2010 to December 2012, he was the Executive Director of the Office of Permits Management for Puerto Rico; and from February 2009 to December 2010, he was the Vice President/Secretary of Puerto Rico's Environmental Quality Board. Previously, Mr. Irizarry-Lugo was employed at PREPA where he advised technical staff about compliance with regulations for substances and waste management, managed environmental permits, participated in environmental audits to prevent noncompliance, and recommended remediation activities for spills. Mr. Irizarry-Lugo has participated in public hearings and prepared reports related to legislative proceedings on environmental topics.

Governing Board Profiles

Gerardo A. Loran, Esq., serves as the Ex Officio Member representative from Puerto Rico's Fiscal Agency and Financial Advisory Authority. According to the enabling law for the Fiscal Agency and Financial Advisory Authority, the Executive Director is the member of all governing boards of government instrumentalities, but he is allowed to appoint or designate a representative in his stead. Mr. Loran is Executive Vice President of the Fiscal Agency and Financial Advisory Authority, in which he directs the Special Projects and Utilities Division. Before entering public service, he worked in private banking for 16 years. During that period Mr. Loran was a key part in structuring and financing more than \$700MM in assets, with particular focus on the field of real estate, hospitality and manufacturing. For the past years he has specialized in the areas of energy and project finance. Mr. Lorán has a Bachelor Degree in Business Administration (B.B.A.) from the University of Puerto Rico, a Master Degree in Quality (M.B.A.) from the University of Turabo, and a Juris Doctor (J.D.) from the Inter-American University of Puerto Rico. Mr. Lorán has also been admitted to the practice of law in Puerto Rico.

Omar J. Marrero, Esq., is the Executive Director of the Puerto Rico Public-Private Partnerships Authority, the Puerto Rico Ports Authority, and the Puerto Rico Convention Center District Authority. Prior to his appointment to these positions, he occupied key positions in public service and the private sector. Mr. Marrero practiced in corporate, securities, real estate, consumer protection, distribution law, estate planning and government affairs. He has substantial experience in structuring business transactions as well as advising on corporate governance matters. Mr. Marrero has also represented many clients before the Puerto Rico State Legislature in monitoring, appraising and lobbying amendments to legislation. He has also worked in the corporate department of a major law firm in Puerto Rico, in the Legal and Compliance Department of Citibank International PLC and the Trust & Estate Department of Banco Popular of Puerto Rico. In 2012, Mr. Marrero served as Secretary of the Department of Consumer Affairs of Puerto Rico and as a member of the Board of Directors of the Puerto Rico Automobile Accident Compensation Administration. Since 2010, he has taught corporations law, LLCs law and not-for-profit governance as a Adjunct Professor of the Inter-American University of Puerto Rico School of Law.



Appointments made by Governing Board to Assist Until Sector Transformation

Chief Financial Advisor (“CFA”)

- On December 1, 2017, the Governing Board announced the retention of Todd W. Filsinger of Filsinger Energy Partners, as CFA
- The CFA will lead restructuring efforts, financial operations, operational restructuring, and transformation process to the extent of PREPA’s involvement. This also includes budgeting responsibility, expense approvals, Fiscal Plan and transformation plan implementation to the extent of PREPA’s involvement, dealings with the FOMB, stakeholders, etc.
- The CFA reports directly to the Governing Board

Director for Strategic Transformation Initiatives (“PMO Director”)

- Lead the PMO
- Develop clear & specific policy rationales for project prioritization, implementation approach and timelines
- Manage and supervise working groups, internal staff, special advisors, procurement of external legal and consulting resources
- Develop and report on relevant transformation metrics and KPIs
- Ensure PREPA meets transformation implementation schedules established by relevant governance and oversight entities
- Manage preparation of required reports with assistance from Special Advisors & Working Group Leads
- Promote internal (PREPA) stakeholder engagement and transparency
- Oversee engagement with external stakeholders
- Assist with external communications and media relations

DRAFT SUBMISSION – SUBJECT TO MATERIAL CHANGE

Appendix - Energy Sector Transformation

Transformation Plan

January 24, 2018

The information contained herein is preliminary, in draft form and illustrative only and does not represent any agreement by PREPA, AAFAF, the Government of Puerto Rico or any other person or entity affiliated with PREPA or the Government of Puerto Rico (collectively, the "PREPA Parties") to any of the contents contained herein or its incorporation into any fiscal plan or other binding document. The PREPA Parties hereby reserve all rights under section 303 of PROMESA. Moreover, the PREPA Parties reserve all rights under PROMESA section 205 and specifically note that none of the information contained herein constitutes a formal recommendation of the Oversight Board under such section.

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- VI. Federal Funding
- VII. Grid Resiliency

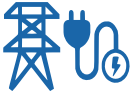


I. Overview of the Goals

The Transformation Plan is Intended to Provide a Roadmap for a Transformed Energy Sector for Puerto Rico



Provides Puerto Rico with a 21st century energy sector that serves as an engine of economic growth while protecting the environment



Builds energy infrastructure that recognizes the need for a transformed and resilient system, while taking into account the projected decrease in demand



Achieves low-cost and reliable energy



Provides sustainable structural and financial models for energy on the Island



Leverages available federal funding for disaster recovery



Increases generation from renewable energy



Provides platform for the implementation of innovative technology to drive efficiencies and improve customer service through operational excellence



Provides, as applicable, professional and independent governance



Relies on a robust and transparent regulatory framework to regulate private and monopoly components of the new energy sector, promote private investment, and implement and manage efficient rate designs and effective incentives

II. Proposed Transformation Process

Transformation Process

Summary

Three different processes to run in parallel

- Concession for T&D system
- P3s for new generation assets
- Sale of existing PREPA generation assets to private investors (or potentially retirement of some assets)

Generation

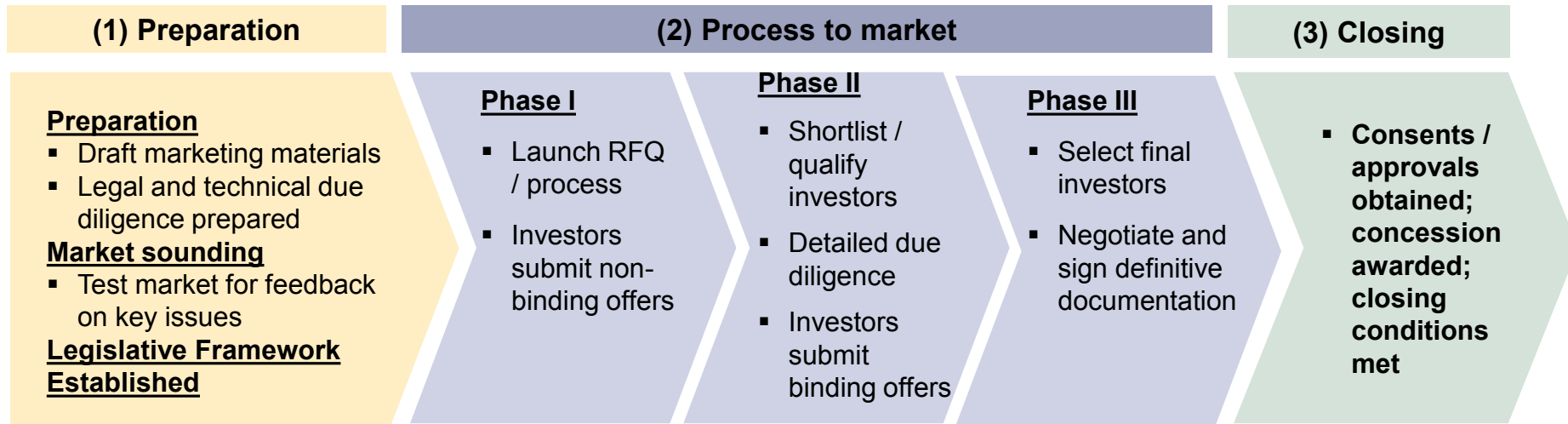
- Existing PREPA-owned generation
 - Sale transactions to private investors for all existing PREPA generation assets
 - Some assets may be retired in the near-term and managed until retirement
- New generation
 - P3s for new generation assets
 - IRP needed to determine new generation requirements
 - Potential to link new generation contracts to ownership of existing PREPA assets (if priority is to avoid orphaned assets)

T&D

- Concession model for T&D network (i.e. remains owned by Government of PR but with private operator)
- Process will only be open to private parties with a track record of operational excellence
- Term of concession to be determined, but likely medium to long-term (i.e. 25 years+)
- Concession terms to incentivize operational efficiencies and reliability targets
- Concession can be structured so as to require and remunerate (through rates) private investment in T&D

Transformation Process – Timeline

All three processes can run in parallel based on the following schedule, or can be sequenced independently, with some processes executed in an accelerated manner



Comparison of Regulatory Structures and Goals

Regulation before and during restructuring

- Provide PREPA with adequate revenues / liquidity pending restructuring via reconciled rate; enable restoration / recovery; prevent asset deterioration
- Facilitate transformation (e.g., asset separation, transfer of public rights and licenses, PPOAs)
- Create framework for transparent, fair, and stable post-restructuring regulatory environment

Regulation post-Transformation

- Regulation of monopoly retail and T&D rates of concessionaire with performance metrics and incentives and rate design “toolbox” including decoupling and multi-year rate plans
- Regulate reliability / resiliency and some aspects of resource planning (e.g., T&D planning, RPS compliance; PPOA approval; reserve margin)
- Establish wholesale market structures and regulate wholesale market as and when it develops



III. Generation transformation and T&D concession structure

End State Structures for Transformation

T&D Concession

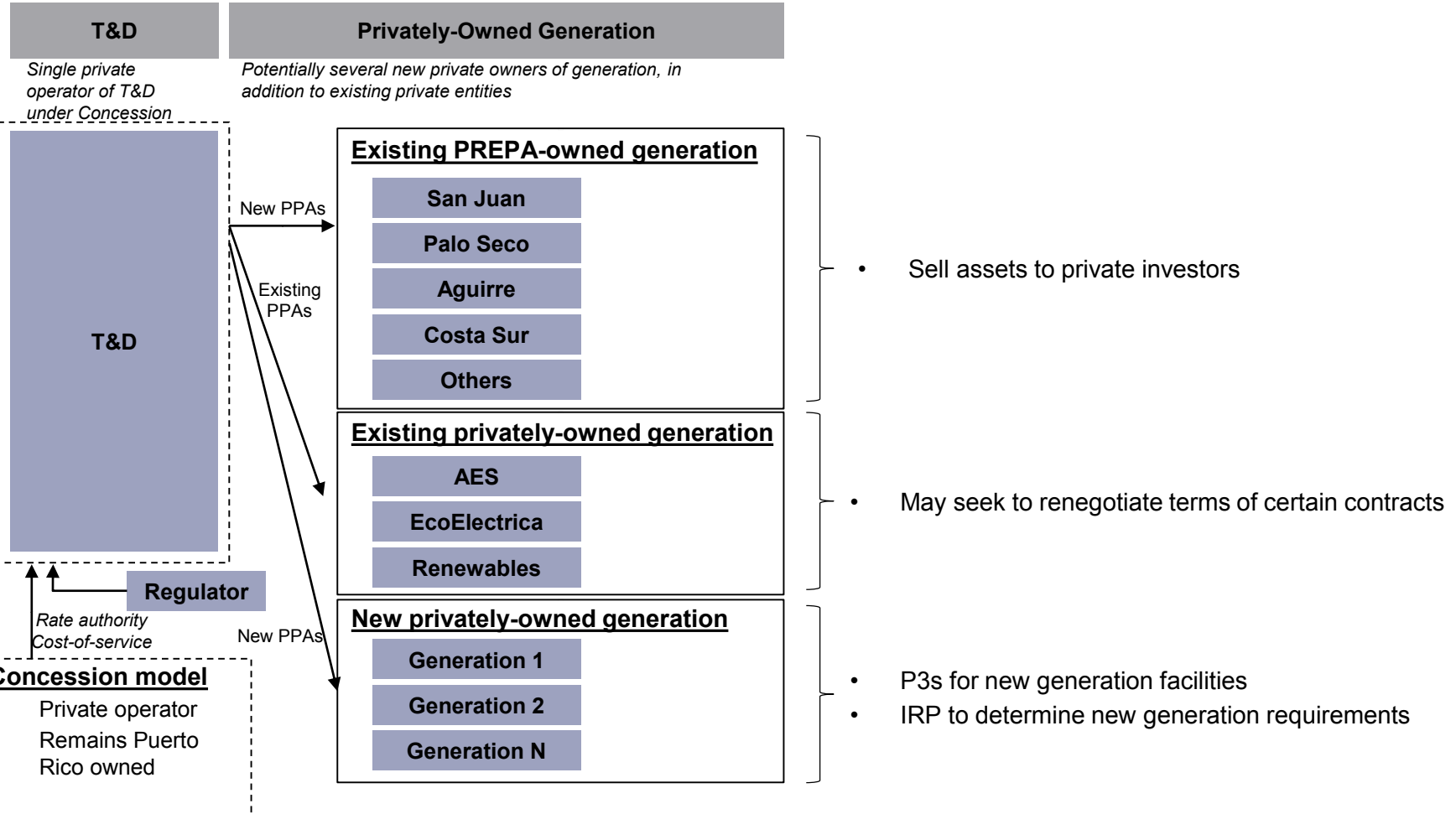
- Delivery and retail utility functions provided by single private concessionaire using publicly-owned wires and retail service assets subject to conditions and rate and performance regulation
- Concession awarded via competitive process
- Concessionaire must make and fund necessary investments not otherwise publicly funded; title to all assets remains public
- Concessionaire receives retail rate revenues set generally under established rate standards
 - Rates recover prudent operating and supply costs
 - Rates include return of/on cost of new investments
 - Potential return on value of other assets and recovery of unrecovered investment costs at end of concession term linked to investment obligation
 - Performance on metrics and incentives can also affect rates and revenues
- IRP and Renewable Portfolio Standard (RPS)
- CPCNs for major investments not authorized by statute, franchise, investment plan, or IRP

Generation Transformation

- New franchises created for one or more privately owned generation companies
- Generation franchises create right to operate utility scale generation and sell to delivery utility
- Franchisees can acquire useful generation assets now owned by PREPA under Title III process
- CPCNs for major new investments not authorized by statute, franchise, investment plan, or IRP including new competitive utility-scale generation
- Energy sales can occur through negotiated contracts (PPOAs) subject to market power test and backup regulation
- Migration to other market structures (e.g., periodic auctions) possible if and as future market develops
- IRP, objective performance standards, reserve requirements, and Renewable Portfolio Standard regulations apply
- Regulation of subsequent purchases / sales / reorganizations under traditional standards



Post-Transformation Structure and Relationship of Entities



Notes: (1) Aggregated DG/DER could also be allowed to participate as a wholesale resource, if and as technically practicable.

60 (2) The regulator is established under Puerto Rico law.

Concession structures

	T&D concession	Management Services Agreement
Description	<ul style="list-style-type: none"> Concessionaire assumes all rights and responsibilities associated with the T&D franchise 	<ul style="list-style-type: none"> A private contractor assumes responsibility for the operation and maintenance of the T&D system Puerto Rico retains ownership of all T&D / customer care utility assets and continues as ultimate service provider
Typical duration	<ul style="list-style-type: none"> 25 years + 	<ul style="list-style-type: none"> 10 – 15 years
Sources of revenue to private entity	<ul style="list-style-type: none"> Concessionaire has the right to collect all revenues (and the responsibility to pay all costs) generated by T&D system Return will depend on investment, performance, and tariff design; in a standard cost-of-service approach, the Concessionaires receive a return on and of any capital invested in the T&D system 	<ul style="list-style-type: none"> Base fee: a fixed annual payment Performance fee: incentive fee payable if agreed operational efficiency and reliability targets are met Publicly owned entity maintains right to collect all revenues (and the responsibility to pay all costs) generated by the T&D system



Concession structures (cont'd)

	T&D concession	Management Services Agreement
Rationale	<ul style="list-style-type: none"> ▪ A Tier 1 utility operator assumes responsibility for the T&D franchise ▪ Responsibilities would cover all aspects of the T&D system – including providing any needed capital investment 	<ul style="list-style-type: none"> ▪ A Tier 1 utility operator assumes responsibility for the O&M of the T&D system ▪ Structure is practicable and relatively straightforward to implement
Issues / considerations	<ul style="list-style-type: none"> ▪ Market appetite would need to be tested and structure would need to be made attractive to an incoming private entity ▪ Concessionaire primarily makes a return by investing capital; inflow of federal funds could limit this ▪ Recovery of capital investment: if concession is terminated prior to recovery of investment, either the government or next Concessionaire would need to pay or assume that capital investment ▪ Pre-approval rights for Concessionaire's capital expenditures v. after-the-fact prudent / used / useful regulatory review ▪ Pass through of costs to provide management / operational services outside of the rate setting structure 	<ul style="list-style-type: none"> ▪ Private operator is not responsible for capital investment, so beyond the availability of federal funds, another source of capital investment would be required ▪ Ultimately, the only downside for the private entity is not earning its incentive payment, so overall responsibility is limited

IV. Criteria for Private Partners

Criteria for Identifying and Selecting Private Components will Prioritize Operational Expertise and Delivery of Power Sector Reform Consistent with Sustainable Economic Growth

Priority criteria	Objectives and rationale	Example evaluation criteria
Promote economic growth	<ul style="list-style-type: none"> Provide achievable roadmap for operating the electric grid that realizes or exceeds all targets set in Transformation to promote economic growth in Puerto Rico, including minimizing the overall cost of power, improving system reliability and resiliency, offsetting demand loss, and complying with environmental requirements Propose rate structure consistent with goals for economic recovery in Puerto Rico and that sustains continued private investment 	<ul style="list-style-type: none"> - How fast is grid maintenance plan going to be completed? - Confirmation what is the lowest rate possible
Provide operational expertise	<ul style="list-style-type: none"> Demonstrate experience with best-in-class utility operations, including efficient execution of operations and maintenance and ability to integrate new technologies quickly and cost-effectively to benefit the transformed system, e.g. smart grid solutions Demonstrate ability to anticipate and address future challenges to current and transformed operating model, including increased distributed energy resources; variable energy resource integration, and changing customer demands for dynamic pricing and innovative services 	<ul style="list-style-type: none"> - What is the proposed O&M cost versus PREPA's current O&M structure? - What revenues are projected?
Provide low-cost capital	<ul style="list-style-type: none"> <i>Transmission and Distribution</i> - Provide expertise and access to sufficient low cost private capital to achieve and maintain over the entire concession term a modern and transformed energy grid infrastructure, including appropriate smart grid technologies <i>Generation</i> – Provide up-front capital at low cost to ensure necessary generation is available and enable generation portfolios with increased renewables penetration 	<ul style="list-style-type: none"> - How much capital is/are the acquirer(s) willing to inject to develop the energy grid? - How much of this capital will go to increasing renewables?
Deliver value from sale	<ul style="list-style-type: none"> Given the context of Puerto Rico's energy sector transformation and its importance to the Puerto Rican economy, maximizing transaction proceeds will only be one factor in determining the best bid(s) 	<ul style="list-style-type: none"> - What will creditors' recoveries be in transaction? - Will transaction provide proceeds sufficient to repay federal loans required to be repaid, if any?

Local Market Concerns and Objectives (e.g., Rates; Reliability; Transparency)

In the post-Hurricane Irma and Maria era, local market concerns, challenges, and objectives have amplified

Traditional Concerns

- Cost of energy
- Quality (voltage and frequency)
- Frequency and duration of interruptions/outages
- Environmental Compliance

New Post Hurricane Concerns

- Overall resiliency and redundancy
- Increased recovery times
- Operational continuity
- Generation redundancy and distribution
- Transmission and Distribution capacity and resiliency

These concerns must be addressed when transforming the Island's energy sector so as to:

- Minimize manufacturing losses and/or backlogs
- Increase Productivity
- Avoid/minimize need for backup/redundant systems
- Avoid/minimize equipment damages
- Retain/attract manufacturing, commercial, and business operations
- Maximize capital investment, economic growth and job creation
- Avoid creating new or additional stranded and inefficiently shifted costs
- Improve quality of the environment and public health



V. Proposed Regulatory Framework

Current Legal and Regulatory Structure

- Under Puerto Rico law, electric utility service is provided by a publicly-owned monopoly provider, PREPA
 - PREPA's obligation to serve is statutory
 - Puerto Rico law does not authorize private utilities that serve the general public
 - Private utility-scale and distributed generation exists and has been growing. Large generation typically sells to PREPA under long-term power purchase contracts; other generation is generally “behind-the-meter” and customer-specific. Private generation does not function as a utility.
- Key functions and obligations are statutorily assigned to PREPA, including maintenance of certain subsidies (e.g., RFR) and programs (e.g., Net Metering), compliance with RPS standards, and preparation of an Integrated Resource Plan (IRP)
- PREC is designed to regulate PREPA as a public entity; its regulatory authority over private electric service companies is limited and unsuited to private utilities or a concessionaire
 - Essential private regulatory functions are missing (e.g., franchise creation, CPCNs, capital and financial controls, corporate restructuring, condemnation)
 - Other core functions (ratemaking, IRP) are hardwired to PREPA's public status
 - Ill-defined jurisdiction and authority will not create or support investor confidence

Key Features of Transformed Structure

- New or amended legislation adapted to the transformed industry structure, but maintaining key public policies and customer protections
- Authorize private ownership of generation and for a private concessionaire to provide delivery and retail utility service using public “wires” and customer service assets
 - Generation franchises and utility concession awarded competitively
 - Franchises and concessions include obligations and performance standards as well as providing for ongoing regulation including of performance, rates, and reliability
 - Details may be statutorily specified or left flexible for later decision by regulator or others
- Allow for access to and use of available federal funding for restoration and recovery
- Legislation to reform the regulatory process and replace PREC and its core functions with a new structure (e.g., Public Service Commission) designed to create stability and market confidence:
 - Regulate rates; recover prudent costs and market return on investment
 - Set appropriate “rate base” and returns for concessionaire
 - Use proven incentive and rate tools suited to promoting efficiency and investment
 - Set, measure, and manage objective performance standards and incentives
 - Authority over complaints, interconnections, service rules, etc., maintained
- Non-structural policies (special rates, grandfathered net metering, CILT) preserved absent express decision to change

Key Post-Transformation Regulatory Functions

- Retail rate regulation of monopoly retail and delivery functions of concessionaire
 - Rates recover operating expenses; maintain pass-through of generation and recovery of CILT/subsidies
 - Rates recover market required capital costs of new investment over term (mechanisms may include inclusion of startup assets in “rate base” and/or end of term recovery of unrecovered capital costs)
 - Major capital project / budget pre-approval mechanism
 - Accurate, economically rational rate design for Distributed Resources, microgrid services, and other special services; decoupling to promote recovery of cost based revenue requirement and avoid efficiency disincentive
- Generation regulation
 - Recover costs of non-rejected and new PPOAs, subject to backstop rate review authority if there is market power; costs recovered via pass through rates
 - Cost of service regulation (potentially with incentives) of owned generation
 - Regulation of wholesale energy, capacity, and ancillary services markets, as required and if and as markets develop
- Performance metrics for delivery and generation functions
 - Highlight goals for utility action
 - Objectively measure utility performance
 - Incentivize utility behavior through meaningful reward and/or penalties linked to utility investment and other actions
- Revised IRP process
 - Accommodate private generation and DER
 - IRP process adjusted to final structure aimed at ensuring reliability, RPS compliance, and least cost grid and major investment planning
- CPCN regulation of new private generation and major wires investments

Rate and Incentive Tools

Proven regulatory tools can incentivize and promote investment, efficiency, and high performance on metrics in Puerto Rico in the context of well-understood established regulatory models.¹ These tools can be used at the time a included in the franchise / concession and thereafter by the regulator. Particular tools can be chosen and refined as investor discovery proceeds and as other policy, market structure, and future investment needs solidify.

Performance and Investment Metrics

- Direct adjustment of revenues and returns has been successfully used to incentivize performance and support development of selected assets and/or projects. Operational performance metrics can include both rewards and penalties, especially where the metric is strongly under the utility's control.
- Examples include FERC incentive rates for certain transmission projects, ROE/ROR incentives for achieving designated operational and economic KPIs (e.g., IL) and/or "output" incentives (e.g., UK).

Multi-Year Rate and Investment Plans

- Formal mechanisms that set or cap rates or revenues over time taking into account attrition, inflation, and target innovation and efficiency gains. Less formal versions include rate steps or freezes. They aim to offer greater regulatory certainty to customers and utilities while increasing incentives to control costs, make specific investments and innovate.
- The UK, Ontario, and more than fifteen US states (e.g., GA, CO, CA, NY, IA) have used versions of multi-year rate plans with positive effects on efficiency and cost containment.

Decoupling / Revenue Adjustments

- Mechanisms to offset or mitigate the impact on utility revenues and cost recovery of attrition caused by, e.g., economic turmoil, energy efficiency and demand response efforts, or DER penetration, especially where there are no parallel reductions in utility costs.
- Various forms of decoupling have been widely adopted across mainland jurisdictions, especially in jurisdictions with strong commitments to energy efficiency and demand management (e.g., NY, CA, MD, OH, IL) and decoupling forms a part of the UK regulatory scheme.

Trackers and Formula Rate Mechanisms

- Mechanisms to periodically adjust rates or allowed revenues in response to changes in costs and/or sales, especially where those changes are significant and unpredictable. May be symmetric and coupled with performance incentives and prudence review. Can also be used to retroactively reconcile rates and revenues to account for unexpected changes or emergencies.
- Variations include full formula rates (e.g., FERC, IL) and targeted capital and expense trackers used in countless states and provinces and in Puerto Rico in the existing CILT, subsidy, and Fuel+PP riders.



Performance Metrics – Function & Criteria

Reliability Resiliency Affordability Safety Efficiency Service

Metric should:

Objectively Measurable

- ▶ Have a clear definition
- ▶ Be capable of reliable and consistent measurement
- ▶ Be verifiable and not be subject to manipulation {or litigation}

Controllable by the Utility

- ▶ Reflect the actions and performance of the utility measured
- ▶ Be indicative of performance and performance improvement
- ▶ Adjust or be normalized for exogenous factors where practical

Promote Policy Goals

- ▶ Indicate achievement of one or more of the overall goals of the transformation or the public policy of the Government of Puerto Rico
- ▶ Be material
- ▶ Not be duplicative



Potential Performance Metrics

- **Delivery System Reliability**
 - System and district interruption statistics – SAIFI, SAIDI, CAIFI, CAIDI
 - Customers experiencing more interruptions than targets
 - Frequency of transmission outages / contingencies affecting customers or dispatch
- **Generation Reliability & Efficiency**
 - Unit availability (by franchise holder and unit)
 - Forced outage rate (by franchise holder and unit)
 - Environmental compliance
- **Resiliency**
 - Critical infrastructure protection / hardening (plan compliance)
 - Preventive maintenance backlog
 - Critical customer support (monitoring, redundancy, hardening)
 - Emergency recovery plan compliance
- **Safety**
 - OSHA recordable events
 - OSHA citations / violations
 - Customer injury rates

Potential Performance Metrics

➤ Affordability

- Delivered price (normalized; metrics will vary for different types of utilities)
- Dispatch efficiency
- Uncollectible balances
- Days of sales outstanding, by class and private / government
- Non-technical losses / UFE
- Theft / tampering recoveries
- Rate of successful completion of payment plans

➤ Customer service functions

- Timely metering reading and billing rate
- Actual vs estimated reading rate (AMI and manual)
- Customers on AMI/AMR
- Call center time to answer / physical office wait times
- Time to respond to service requests (by class / district as appropriate)
- Time to respond to billing / service inquiries

➤ Regulatory Compliance / Performance

- Compliance with concession conditions (completion and cost)
- Compliance with approved investment plans (completion and cost)
- Time to process interconnection requests (excluding delays attributable to customer)

VI. Federal Funding

Federal Funding

- Permanent work to mitigate damage to the power sector will likely be through alternative procedures provided under Section 428 of Stafford Act
- Timing and amount of funding is unclear
 - Initial damage assessment likely to take twelve months
 - Negotiation of fixed payment to Government of PR to address damage to power sector
- May be used to fund rebuild of current system or for an alternative use depending on agreement
- Timing, amount and terms will determine how the Federal funding will be integrated into plans for the energy sector transformation
- Concession structure will take into consideration available federal funds and compliance with applicable, relevant federal funding requirements

VII. Grid Resiliency

The Puerto Rico Energy Resiliency Working Group (ERWG), led by NYPA, Prepared a Grid Resiliency Rebuild Assessment

- Immediately following hurricane Maria, PREPA set out to review and assess damage to the system and began emergency restoration
- Damage assessment and emergency restoration efforts were supported by NYPA, ConEd, and USACE. Further damage assessment and resiliency rebuild estimates were developed by The Puerto Rico Energy Resiliency Working Group, comprised of the following members:
 - New York Power Authority, Puerto Rico Electric Power Authority, Puerto Rico Energy Commission, Consolidated Edison NY, Edison International, Electric Power Research Institute, Long Island Power Authority, Smart Electric Power Alliance, U.S. Department of Energy, Brookhaven National Laboratory, and the Public Service Enterprise Group
- The Puerto Rico Resiliency Working Group estimate for the cost to rebuild with minimum resiliency to withstand extreme Category 4 storms and sufficient design margin to ensure high survivability for Category 5 events are summarized below
- Absent substantial federal funding for the rebuilding effort, the Energy Resiliency Working Group recommendations cannot be implemented

Rebuild Recommendations	Total (millions)
Overhead Distribution (includes 38kV)	\$5,268
Underground Distribution	\$35
Transmission - Overhead	\$4,299
Transmission - Underground	\$601
Substations - 38kV	\$856
Substations - 115kv & 230kV	\$812
System Operations	\$482
Distributed Energy Resources	\$1,455
Generation	\$3,115
Fuel Infrastructure	\$683
Total Estimated Cost	\$17,606

Source: Puerto Rico Energy Resiliency Working Group report, November 2017



Grid Resiliency – Potential Grid Improvements

The ERWG made recommendations for improvements and replacements that cannot be achieved by PREPA absent substantial federal funding.

Hardening & Resiliency Executive Summary

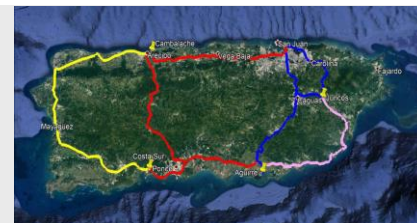
- ▶ **Generation:** Relocate smaller coastal or river-located facilities, use of load frequency control, build back renewable energy sources, and integrate DER
- ▶ **Transmission:** New monopole towers, high strength insulators
- ▶ **Substations:** Defense-in-depth (multilayered) flood protection
- ▶ **Distribution:** Use of concrete and galvanized steel poles, new backup control center
- ▶ **System Ops:** Use of microprocessor-based devices and proven control system technologies

Generation Related Improvements

- ▶ **Aguirre Plant :** Test and inspection; base repairs; spares replacement; storm hardening; install H-class machine at Aguirre to address MATS compliance, system stability, and fuel diversification issues
- ▶ **Palo Seco Plant:** Installation of dual fired F-class machine to address MATS compliance, system stability, and fuel diversification issues; storm hardening
- ▶ **Other Plants:** Test and inspection; base repairs; spares replacement; storm hardening

Transmission Related Improvements

- ▶ Relocate 230 KV Transmission lines to existing highways (see image)
- ▶ Replace poles for higher wind rating; move high risk lines underground
- ▶ Straighten and grout existing poles or replace with deeper subgrade and/or engineered foundations
- ▶ Improve insulators, particularly in salt contamination areas

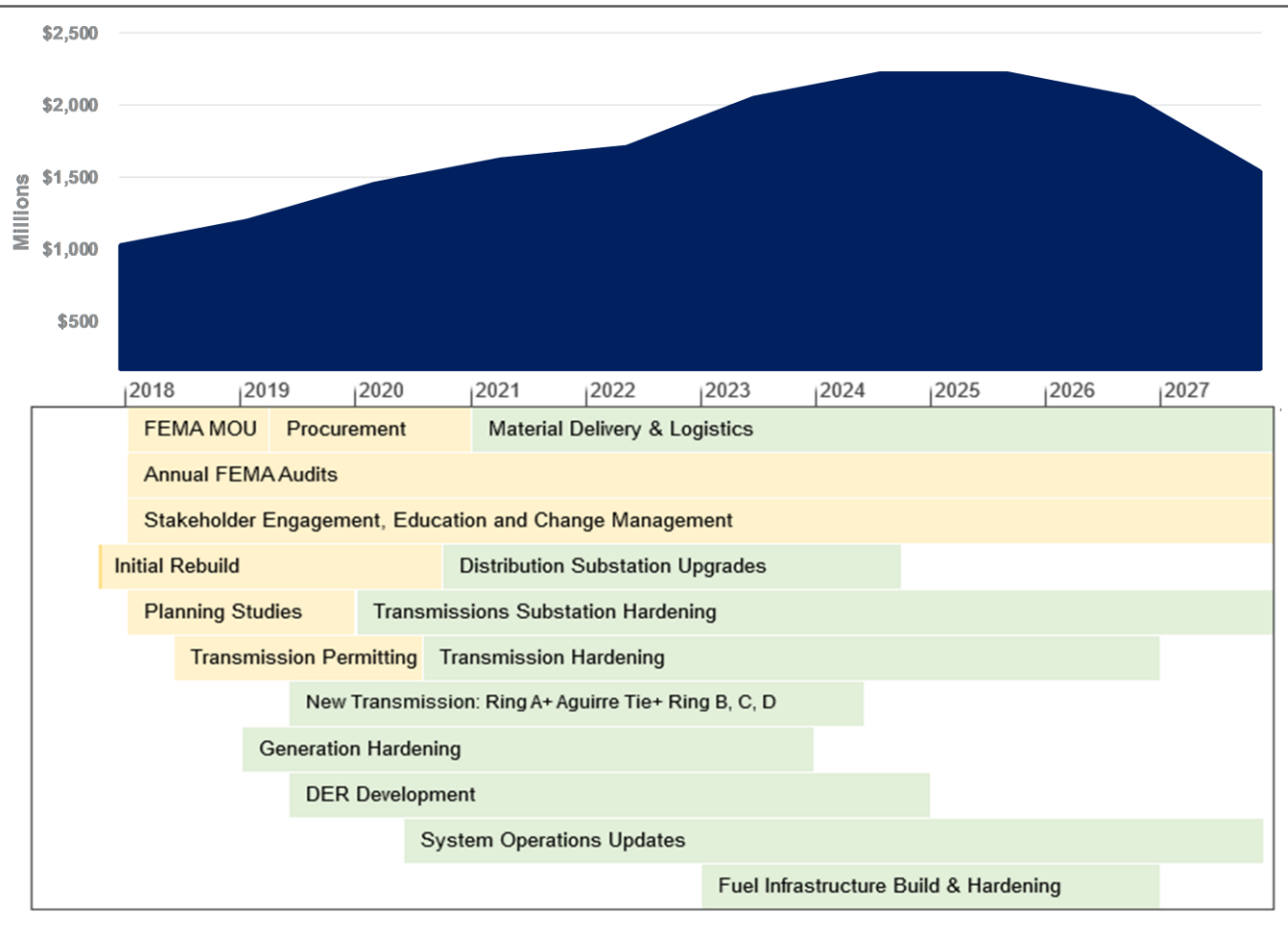


Distribution Related Improvements

- ▶ Replace poles for higher wind loading, install breakaway service connections, install fully insulated wire, relocate distribution away from transmission, selectively underground distribution
- ▶ Replace poles with deeper subgrade support, selectively underground in areas with water-driven debris
- ▶ Relocate lines to accessible street level, selectively replace overhead with underground
- ▶ Add automated switches with FDIR capability
- ▶ Improve insulators, particularly in salt contamination areas

Timeline of Recommended System Improvements by the ERWG is Conditioned Upon Receipt of Necessary Federal Funding

The ERWG laid out a timeline for implementation and funding of recommended system improvements over time. The timeline ignores any constraints on funding, and provides guidance on estimated sequencing and duration of activities.



► Activities underway or expected to begin in early Q1 2018:

- Rebuild and repair of salvageable substation equipment, fences, communications equipment, and restoration of physical security.
- FEMA audit (A-133 or single audits) preparation required for any entity that expends \$750,000 or more of federal assistance. Filings for 2017 expenditures must be completed by September 30
- Transmission studies, engineering assessments, DER site studies, and other planning studies